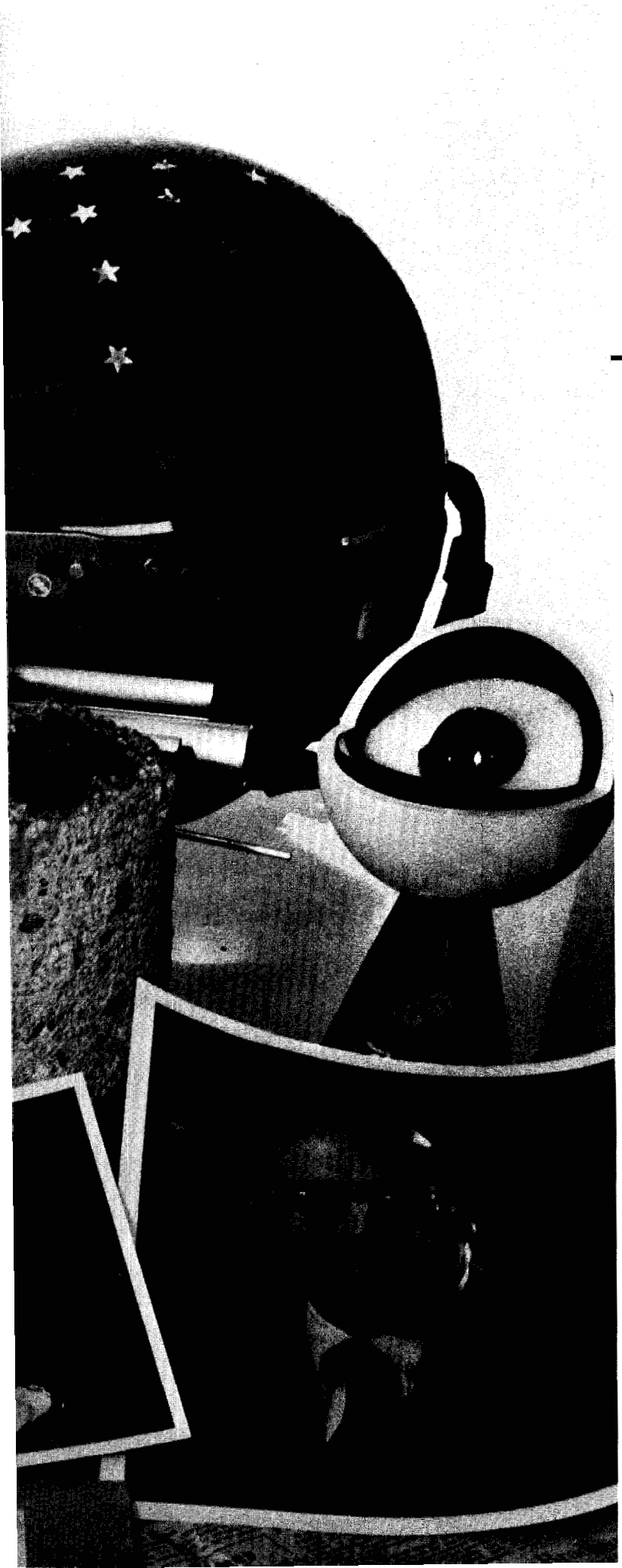
MAY/JUNE 1980

atom

LOS ALAMOS SCIENTIFIC LABOR



inside this issue

Telling history, and combining it with the present into "perspective," can be overdone. A classmate once said, "Enough is enough; too much is plenty." Questionable vocabulary, but comprehendible.

It's difficult to make the anti-redundancy case with Los Alamos. WW II and its ending by atomic weapons have not been forgotten. Book writers and movie makers continue to ply this subject to the present, involving Project Y veterans in their work, trying at times to tie in the Atomic Age 35 years later.

We've attempted here to show a bit of Los Alamos through the eyes of several "oldtimers," though we may be criticized for our omissions. We've spoken with Director Don Kerr and his predecessors. We've looked at the genealogy of technical divisions, the return of Enewetak, and a selection of events from 1943 to 1980.

We hope you'll find interesting material not only from the 1940s but for the 1980s as well. We've produced this issue partly for the June 13-15 weekend, when the third oldtimers' reunion (following 1970 and 1975) is held concurrently with the fifth Family Days open house (following 1955, 1965, 1973 and 1977). This summer marks the 35th anniversary of the Trinity test and the strikes against Hiroshima and Nagasaki.

Jeff Pederson

atom

Vol. 17, No. 3

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On the cover: Laboratory history includes molecular studies, the Fat Man bomb, the water boiler reactor core, the Rover nuclear rocket program, a lead helmet worn during airborne sampling missions, a core from the Subterrene earth-melting project, and a laser fusion target.

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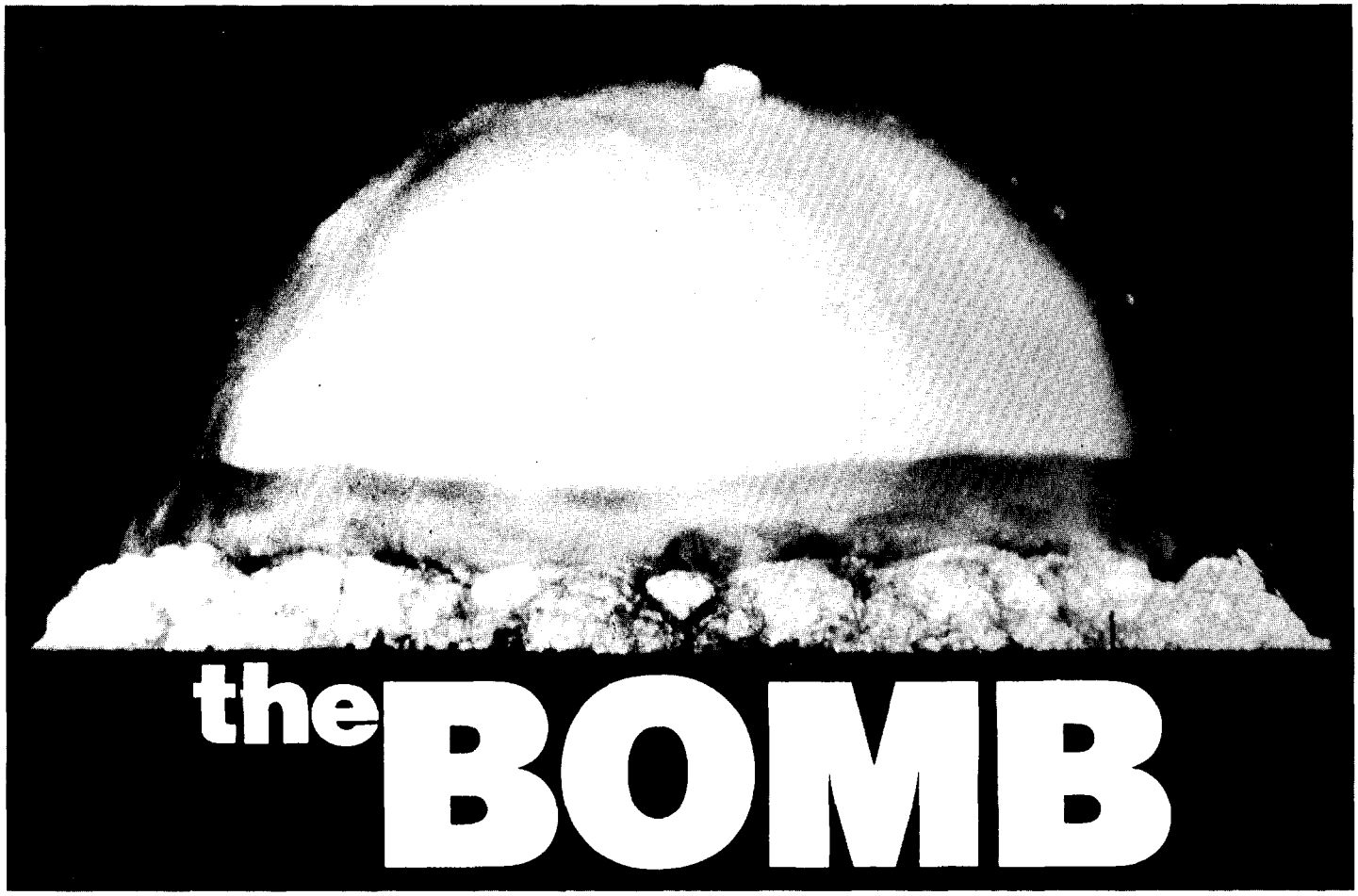


the BOMB

Military considerations had governed the decision, by 1943, that an atomic bomb was a desirable means to end World War II. Scientific considerations had governed the decision that an atomic bomb was probably feasible. It remained to be seen whether the technological considerations could come to fruition within a reasonable time.

At the time of the founding of Los Alamos Laboratory, all the world's plutonium could have been piled on the head of a pin. Thus in January 1943, not only was there no fissionable material for bomb making, but construction of the Tennessee and Washington plants from which the material would come had not even begun.

Methods of devising a bomb that derived its explosive energy from the fission of U-235 or Pu-239 were purely speculative. The engineering effort was entirely in the future, and it would depend heavily on the results of physical, chemical, and metallurgical studies of the two possible core materials. These studies would have to be made on extremely small quantities of uranium and plutonium, so that the necessary knowledge would be gained by the time larger quantities became available.

Thus it was that the Los Alamos Laboratory, or Project Y as it was called, became the crucial part of a super-secret nationwide research and development program known as the Manhattan Engineer District of the War Department. While other groups worked toward development and production of materials, the mission of the Laboratory, under the direction of J. Robert Oppenheimer, was to perform the necessary research, develop the technology, and then to produce the actual bombs in time to affect the outcome of the war.

Until the spring and summer of 1942, the Los Alamos Ranch School on the Pajarito Plateau seemed about as far from war as was possible to get. Then, just as the annual summer program was in progress, school officials noticed frequent low-flying aircraft that seemed to study the area. Cars and military vehicles appeared on the crest of the road that led up from the valley.

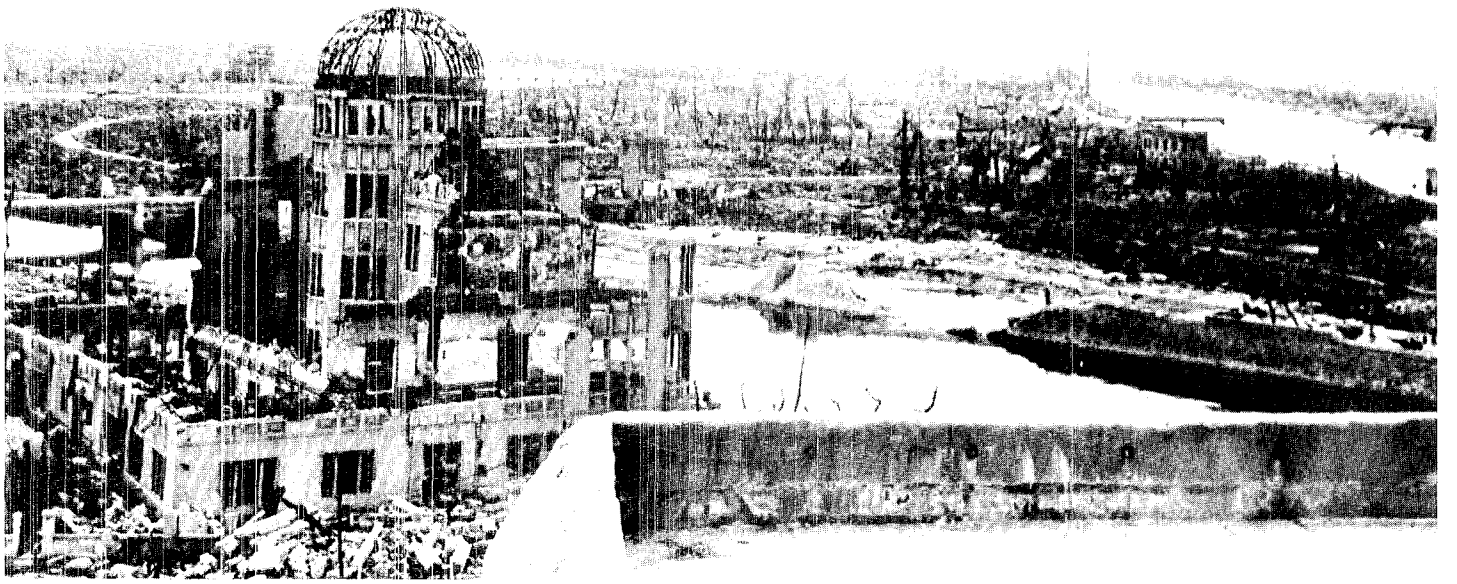
In autumn, school officials were enlightened: the War Department was interested in the property. On the first anniversary of Pearl Harbor, December 7, 1942, and five days after Enrico Fermi achieved the first nuclear chain reaction, notice was received in a brief communication from Secretary of War Henry Stimson that the school was being taken over. The government used condemnation proceedings and all records were sealed until 1961.

On January 1, 1943, the University of California was selected to operate the Laboratory and a formal nonprofit contract was soon drawn with the Manhattan Engineer District. By early spring major pieces of borrowed equipment were being installed and a group of some of the finest scientific minds in the world were beginning to assemble on the Hill.

The first stop for all new arrivals was the Project's Santa Fe office at 109 East Palace Avenue, where Dorothy McKibbin extended warm welcomes for 20 years.

Haste and expediency, under urgency of war, guided every task. While supplies arrived, workers struggled to erect buildings to house new equipment. Streets and roads appeared daily, following the blades of countless bulldozers. Fuller Lodge became a restaurant and the other handsome buildings of the school were quickly converted to Project Y

The secret Manhattan Engineer District achieved its goal of constructing atomic weapons to bring WW II to an end. Left: The rising fireball from the Trinity test, July 16, 1945. Below: Hiroshima, Japan, August 1945.



use. The masters' houses became residences for top personnel. As the only group of buildings offering bathtubs instead of showers, this group of buildings became known as "Bathtub Row."

Hurriedly built housing was being thrown up everywhere, but it never quite caught up with the demand.

In 1944 the Laboratory saw its first laundry and dry cleaning concession. The first resident dentist arrived that year and Los Alamos was on its way to making the transition from a war camp to a town. Both of these developments followed the 1942 establishment of a 12-grade school system with 16 teachers. A town council was formed the same year.

In 1945, a group including Hans Bethe and Enrico Fermi founded a loosely knit Los Alamos University.

Throughout, anonymity and secrecy prevailed. Laboratory members were not allowed personal contact with relatives nor were they allowed to travel more than 100 miles from the project. Famous names were disguised and occupations were not mentioned.

Director Oppenheimer began weekly colloquia, an idea that originally went against the Army's wishes of compartmentalizing, which called for no one person to see the overall progress or purpose of the mission.

By September 1944, the first kilogram of highly enriched uranium had been received from the separation plant at Oak Ridge. By July 1945, 50 kilograms had been received and the enrichment had increased.

The first small quantities of plutonium arrived at the Laboratory in October 1943. Gram amounts were delivered early in 1944, and soon still larger amounts arrived, first from Oak Ridge and later from Hanford.

Both the uranium and the plutonium needed purification, a process that was under study at Los Alamos as early as August 1943.

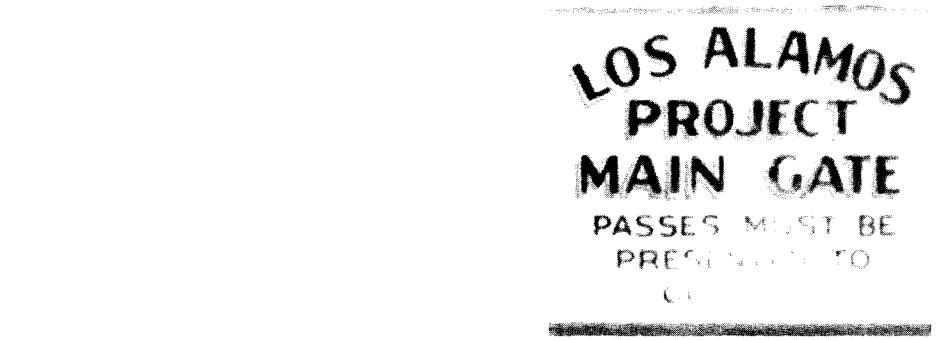
As work on the bomb progressed it became obvious that testing would be necessary. In March 1944, group X-2 was formed under the leadership of Kenneth T. Bainbridge, whose duties were "to make preparations for a field test in which blast, earth shock, neutrons, and gamma radiation would be studied and complete photographic records made of the explosion and any atmospheric phenomena connected with the explosion."

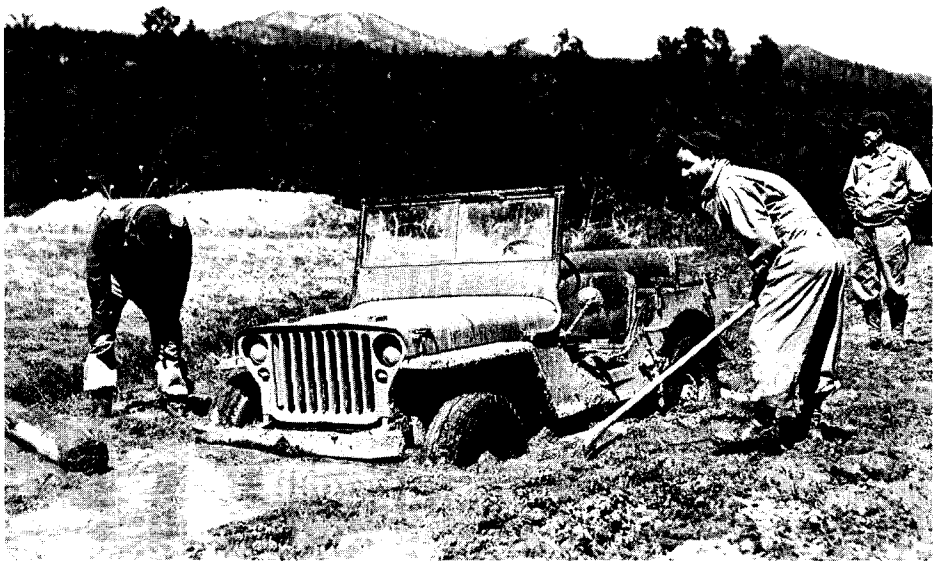
Project Trinity became an official organization and top-priority project of the Laboratory in March 1945. At the same time Project Alberta, for combat delivery of the weapons, was organized.

May 7, 1945, marked the trial run for the Trinity event, when 100 tons of TNT were set off. Materials were added to simulate, at low level, the radioactive products expected from the nuclear explosion. The brilliant orange fireball could be seen 60 miles away.

Work schedules accelerated in anticipation of the final test at Trinity Site. Scientists not directly involved in the test established a pool on the yield and the trend was definitely toward lower numbers, except for Edward Teller's choice of around 45,000 tons TNT equivalent. I.I. Rabbi won with a guess of 18,000 tons, a number he picked because all the best lower numbers had been taken. Some felt the device wouldn't work at all.

On July 16, 1945, at 5:29:45 a.m. Mountain War Time, the first atomic bomb was detonated in the desert of southern New Mexico. On August 6 Hiroshima, Japan, was bombed with the world's second atomic bomb; three days later Nagasaki was bombed with the world's third such device. Japan surrendered August 14 and ceremonies were held Sept. 2.





Clouds over the Hill

Mud, a water shortage, lucrative jobs elsewhere, and an absence of national atomic energy legislation placed the Laboratory's future in doubt.

Once atomic weapons had been developed, assembled, and dropped at Hiroshima and Nagasaki, ending WW II, the Laboratory's existence came under increasing doubt. Between July 1945 and July 1947, several events occurred that would make the former secret Project Y post a permanent town and research center.

Technical activity slowed. Many national scientists wondered whether in creating atomic bombs more harm than good had been done for civilization. Many people from universities, industry and government agencies were approached with job offers from elsewhere, often with lucrative salaries. There was an absence of national legislation on the subject of atomic energy.

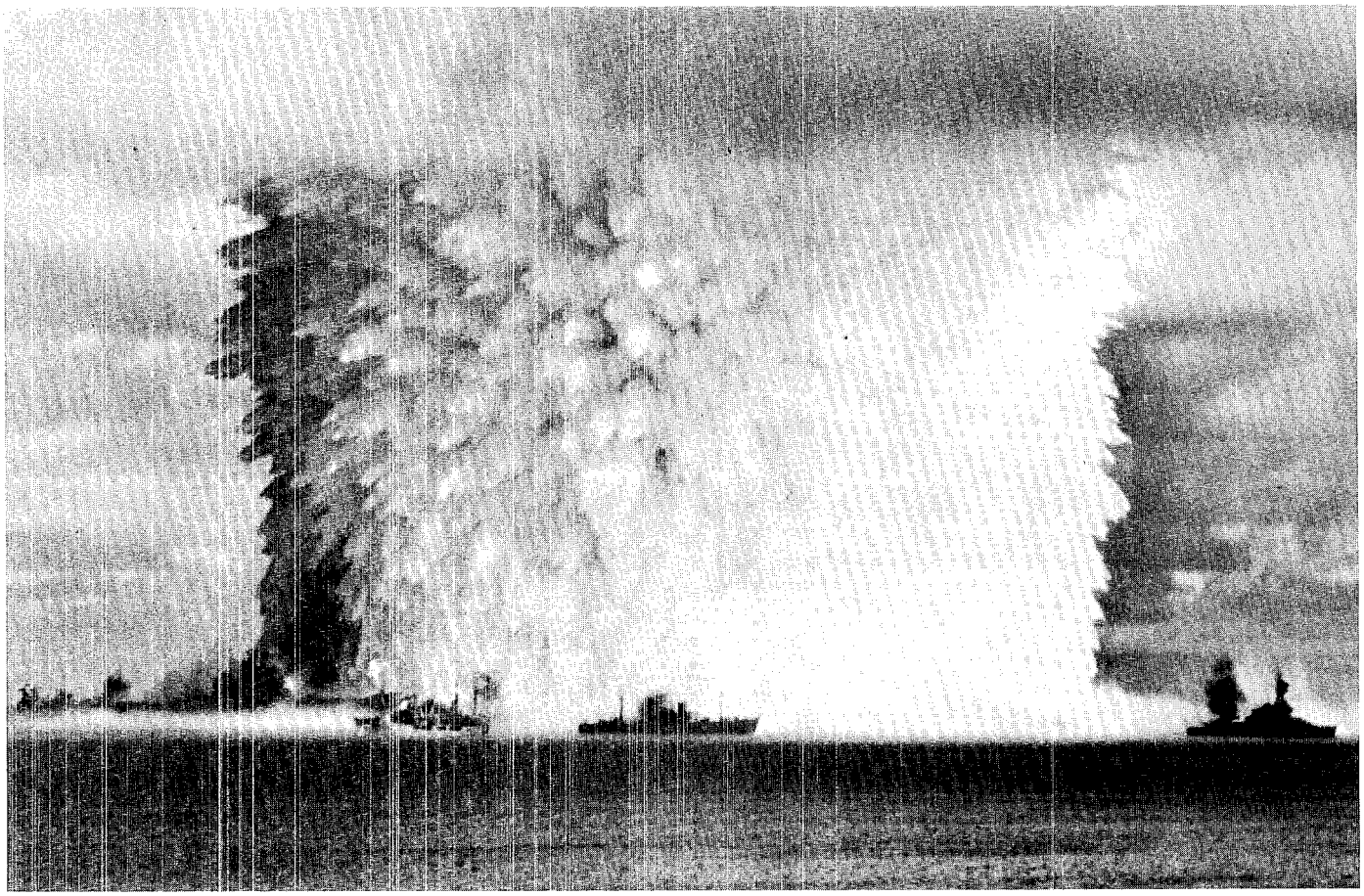
Some felt the country needed a laboratory for military applications, and were willing to gamble the government would agree. They included Norris E. Bradbury, Darol K. Froman, Alvin C. Graves, Marshall G. Holloway, Eric R. Jette, John H. Manley, Carson Mark, Max F. Roy, and Ralph Carlisle Smith, all of whom were here before Trinity.

In October 1945, J. Robert Oppenheimer said he was relinquishing his post as Director. Bradbury, at the request of Oppenheimer and Gen. Leslie Groves, assumed the position October 17 for a six month period. He had been commissioned in the U.S. Naval Reserve after an academic career that included a professorship of physics at Stanford University. He had to maintain an adequate scientific staff, replace 1,600 young scientists from the Special Engineer Detachment, and staff a division for the bomb tests scheduled for the summer of 1946 at Bikini in the Marshall Islands.

Operation Crossroads, set up jointly with the Army, Navy, and the Manhattan Engineer District, was to use fission weapons in three ways. Able: an air burst over an array of ships. Baker: shallow water burst under ships. Charlie: a deep water burst.

The tests took the time of 150 people over nine months. It demonstrated the Laboratory could undertake such an operation despite the departure of much of its senior and experienced staff. Significant technical data were also gained, with new phenomena recorded.

The all-time low for employment was January and February 1946. The water line from Guaje Canyon froze, and trucks brought water from the Rio Grande, hastening the exodus of some. There were 1,000 employees then and a total population of 6,500. Bradbury announced in May that people would have to decide by September 1 whether to stay and work or to leave. Some salary inducements were made. A program of Laboratory consultants was set up.

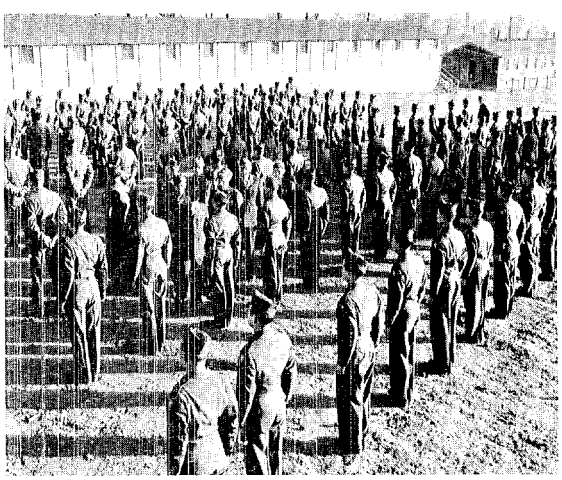


Two serious accidents also occurred during experiments involving critical assemblies. One on Aug. 21, 1945 resulted in the death of Harry K. Daghlian on Sept. 15. The other, on May 21, 1946, caused the death of Louis Slotin May 30. These led to a system of remote control operations in the field.

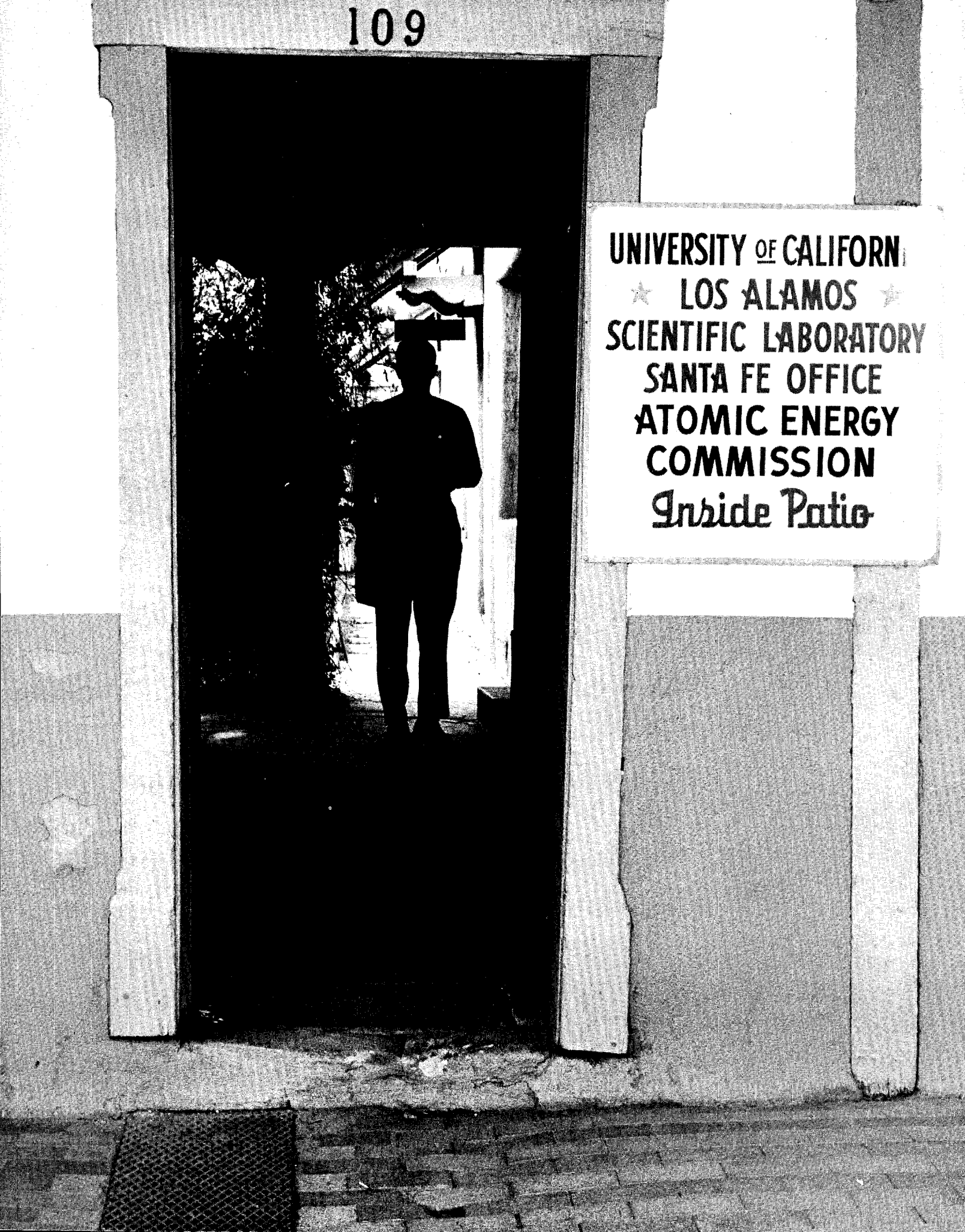
In early 1946, Gen. Groves approved construction of permanent housing. The Zia Co. took over most construction and maintenance from the Army on April 1. Steps were taken to have major weapon components manufactured at other installations.

Most doubts were laid to rest with the creation of the civilian Atomic Energy Commission (AEC) under the "McMahon" Atomic Energy Act of 1946. The AEC officially took over the atomic program Jan. 1, 1947. Actual field management of the Santa Fe Operations Office (later moved to Los Alamos) did not take place until July. The AEC visited Los Alamos in November 1946, and its first priority was the "stabilization and revitalization of the Los Alamos Scientific Laboratory," including housing.

The Laboratory's senior staff, at AEC request, presented an outline of the LASL philosophy and its plan for a long-term operation.



Above: Baker shot from Crossroads, 1946.
Left: Actress Linda Darnell visited with Director Bradbury in late 1940s.
Below: Military had comprised half the wartime Los Alamos population.


109
UNIVERSITY OF CALIFORNI
LOS ALAMOS
SCIENTIFIC LABORATORY
SANTA FE OFFICE
ATOMIC ENERGY
COMMISSION
Inside Patio

What were jobs and lives like more than 35 years ago? Project Y was a pivotal experience for many Manhattan Engineer District workers. Some knew why they were coming; others were ordered to report.

'I'll take Manhattan'

Dorothy McKibbin: Los Alamos' First Lady

Photos by LeRoy N. Sanchez

A strange business at 109 East Palace Avenue, Santa Fe, began with a very offbeat influx of tourists.

Dorothy McKibbin leans forward to explain, brushes back a lock of snow-white hair, and presents the dignified and so-friendly countenance that she has made her trademark. Can one believe she not only took care of a family of thousands, but never spoke of it to family or close friends? It's true.

From 1943 to 1963, McKibbin ran the LASL office in New Mexico's capital city. It was a portaled suite of venerable adobe offices that was the first WW II contact for many Los Alamos scientists and other workers on their way to build the world's first fission weapons in a secret city. A simple sign outside said "U.S.ENG-RS," with the last two letters falling on the lower line.

She issued passes, cared for children, rescued the lost and disillusioned, made housing and transportation arrangements, forwarded freight, and kept an ear to the ground for espionage agents. Perhaps more than anyone else, she earned the title Los Alamos' "First Lady."

But Dorothy McKibbin can tell about these things so much better than we.

Photo file

I came here originally after I had graduated from Smith College and traveled widely with my family. I had always played tennis, loved to dance and swim, ride horseback, camp, climb mountains. It was a shock when in 1926 I learned I had a touch of TB.

My mother and I stopped at La Fonda. Through friends of a relative, I was soon admitted to Dr. Frank Mera's Sunmount Sanitorium, where I stayed a year and recovered completely.

Santa Fe was a town of 12,000 then, 7,000 Spanish and 5,000 Anglos. Many of the artists, musicians, poets, and playwrights living here had come for their health or that of a family member.

I had broken my engagement to Joseph McKibbin because of my illness, but after my recovery we were re-engaged and married in 1927. We lived in St. Paul until his death four years later.

In 1932 I decided to return to Santa Fe and make my home here. This was during the Depression and I was certain you could do more with a dollar here than any place I knew of. More important, I believed it was a good place to bring up my son Kevin.

When my son went to nursery school, I took a part-time job, and later worked full-time at the Spanish and Indian Trading Company, across the street from La Fonda. At fifty cents an hour. I had been there ten years when the owners liquidated the business in 1943, in order to join the war effort.

With the Spanish and Indian closed, I was about to accept a job at the bank. With everybody going away to war, I might be a big high executive by the time it was over, whether I liked it or not. The force of gravity. I was

"Never ask questions and never ask for a name to be repeated."

crossing Palace Avenue, considering the job, when I met Joe Stevenson, who asked if I'd like a job. I asked him, "What kind of a job?" and he said, "A secretary." I then asked what my duties would be. He replied, "Don't you know what a secretary does?" And I said, "Not always." All this fast interplay took place in the middle of the street. In those days, everyone in Santa Fe imparted secrets in the middle of the street.

He gave me 24 hours to think it over. The next day I was still undecided. I walked into La Fonda and saw Joe with a man whom I knew was from California. He wore a light brown silk gabardine suit and the coat matched the pants, and he wore a necktie. I knew he couldn't come from around here. I joined Joe and was introduced to J.A.D. Muncy. Just then a man came down the lobby wearing a trench coat and a pork pie hat, carrying a pipe in his hand. He stopped to speak to the men and I was introduced. I did not catch the name. If I had, it would have meant nothing to me. After a few moments he continued on his way.

I turned to my companions and said, "I will take the job." The reason was that any person as dynamic as that man, with the character and magnetism that he had, I didn't care what his work was. I would be happy to be connected with it whatever it was. He was J. Robert Oppenheimer.

The Santa Fe office opened in March of 1943. Under the name of Mr. Bradley, Robert Oppenheimer had rented it from Mrs. William Field, the owner, for his exclusive use. He selected it because of its location close to the Plaza, and because of its security, with all the office rooms around an inner patio. When I reported to the office and asked what my duties would be, I was told never to ask questions and never ask for a name to be repeated, and that's that. You could never say the word "physicist" in the office, and the words "Los Alamos" were completely forbidden. Later, the people in town began to call it "The Hill."

When Oppenheimer and the first group came out to Santa Fe, housing was not yet completed at Los Alamos. They could use the labs. The Housing Office had rented four ranches between Santa Fe and Los Alamos for the incoming scientists and their families until they could move up to the site. I was secretary to the housing manager. Our office also acquired used cars, trucks and station wagons to transfer people from the ranches to the Lab and return each day.

The first day of May 1943, the housing was ready, so we closed the ranches. Oppenheimer and his secretary Priscilla Greene (now Duffield), who had occupied two offices at the back of the patio at 109, and all the others located in Santa Fe with the exception of myself, moved up to the Hill at that time. My office became the Santa Fe liaison for the people of Los Alamos.

When Rose Bethe, wife of physicist Hans Bethe, arrived, she was made head of housing at the site. Until there was someplace to eat on the Hill, our office sent up box lunches each day for the persons working up there. Rose and I conferred by telephone each morning as to the number of lunches needed. The telephone wires had been laid years before by the Forest Service. Some lines had fallen and had been chewed on by squirrels and chipmunks to their deterioration. Rose and I hoped that by yelling to each other over the phone we might get the sound through in better fashion. I ordered the lunch boxes from different restaurants so they would not wonder why was all the picnicking at this time of year. We were conscious of needing a cover for everything we did. A truck would pick up the boxes and carry them up to the site.

Many of my duties were unusual. For example, I was asked to open Frijoles Lodge in Bandelier National Monument with 100 beds in the summer of 1944 because of another housing shortage. I told the assistant directors I had never run a hotel before. We were talking this over when the inner door opened and the head of Robert Oppenheimer appeared. He said, "Dorothy, I wish you'd do this." So I said yes, and we made our plans, and in five days we had Frijoles open. We had the whole Army to help us. They sent over a generator which could have lighted the whole city of Chicago. They even picked up the garbage daily although we had a disposal plant. Not until about six months later did I learn that the Laboratory was in great disfavor with Mrs. Evelyn Freye, who was Lodge manager. This was because in the summer of '43, the construction people who were building the Tech Area had been housed at the Lodge. They had started to bulldoze trees, they cooked steaks in their bedroom fireplaces, smoking the walls, and they left the place filthy. When that contract was over at the end of the summer, there wasn't much love lost. When I arrived, we arranged for women from San Ildefonso to come in and they performed an expert cleaning job. We hired a chef, Bert Lury, and in discussing salaries with the assistant directors, I asked for ten dollars more a month than we would pay the chef, just for the sake of status.

The personnel office had miscalculated a little and the hundred didn't all come, although we were ready for them. Louis Rosen (now head of MP-Division) was one of the many who did. As I didn't want the government to lose money, we inaugurated Saturday and Sunday sports days at Frijoles to which anyone from the Hill who so wished could come and fish or walk or climb and enjoy a buffet lunch and supper. Some rode horses over. We closed Frijoles before autumn and I returned to my Santa Fe office. I had continued daily contact with it while I was away.

One sunny afternoon at the office, I was called from Los Alamos and asked to go up a hill adjacent to Santa Fe and see if I could locate a Japanese balloon that might be floating over the site. I never said what for, or why, or what's eating you, I said, "Certainly." I didn't tell my staff

where I was going. I went up the hill, looked over to the west, and above the horizon as the sun was setting, I saw a planet—Venus. I went back and made my report and they said, "Yes, but we wanted to be sure it was Venus." It seemed there were rumors of a landing on the northwest coast and of balloons coming over to the most secret place in the world.

At my home was founded what became the Enrico Fermi Institute, with Sam Allison as director. Security did not wish these scientists to be seen in Santa Fe. On arrival in Lamy they were driven to my house in official cars. I had, of course, left before their arrival. What they were gathered together for was to make postwar plans for nuclear energy. I didn't get home until after five, expecting the house would be covered with picnic boxes and paper napkins. I have never seen a place so immaculate.

There were 13 weddings celebrated in my house. I couldn't tell the judge or minister the full names of the couples although these were entered on the certificates. The officiating person would just say, "Do you, Priscilla, take Robert...."

Those persons working on the Hill were not allowed social contacts within 200 miles of the site. When Virginia and Edwin Brooks sold their home and went up there to work, they would come to town sometimes for lunch. There would be a guard in civilian clothes behind them at the next table. Mary Macauley from Santa Fe, who married scientist Art Wahl from St. Louis, could not see her family at their home here; it was against the rules. She would telephone her mother before coming to town and they would meet on the Plaza to visit. Every drug store and hotel and bar in town had G-2 in plainclothes around. I could spot them easily because they were so much better dressed than the natives, in tweed jackets and grey flannel pants and neckties.

The first file I had was a little yellow oak box which contained 100 names. The cards also had the name of the university from which the scientist came, his salary, and his expected address in Los Alamos. That was the number of men expected to be needed on the project. By the end of the war the technical area had grown to 3,000 scientists.

People were instructed to report to 109 East Palace on arrival. If they were military, they'd go to the Bishop Building, a block away. That was P.O. Box 1539, Santa Fe, and we were P.O. Box 1663. One WAC said she was roused from bed at 2 a.m. at Fort Leavenworth, and thought she was going overseas because they told her she couldn't inform her roommate where she was going. I said, "You haven't arrived yet, you have still 45 miles to go." Harriet Peterson, a trained nurse from the University at Washington in St. Louis, came in from Lamy and sat swinging her legs, saying, "If I don't like it up there, I'm coming right down." I said nothing. She stayed to the very end and married Ralph Carlisle Smith. In the early days we averaged 65 persons a day coming to the office and 120 telephone calls.

Frank Oppenheimer once said to me, "Can you convey, in talking about Los Alamos, that none of us knew what we were going to do or what was going to happen to us?" And someone in an article related: "Lamy must be a nice place. I've heard of 20 people who went there and they've never come back."

After the war, it was quite different. Occasionally I would call Priscilla Duffield, secretary to Oppenheimer, and ask, "Do you think I'm going to be fired?" But there was silent understanding that I would do what was needed to be done, and if they didn't like it, they could fire me. I was called a character in those days, and a character has a certain amount of freedom. But we were very busy, showing new employees about housing, having meetings for them, giving maps (Los Alamos was not on standard maps), issuing passes. By 1963, it was on maps, the gates were down, there were good roads up the Hill. Instead of replacing me, they closed the Santa Fe office.

Mrs. McKibbin worked for the Laboratory a little over 20 years. In a ceremony in 1963, a plaque was installed on an adobe wall at 109 East Palace where the LASL office was located. It reads:

109 EAST PALACE
1943 SANTA FE OFFICE 1963
LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
All the men and women who made the first atomic bomb passed through this portal to their secret mission at Los Alamos. Their creation in 27 months of the weapons that ended World War II was one of the greatest scientific achievements of all time.

Photo by Jeff Pederson

Jim Bridge: Nearly missed the town

Jim Bridge nearly missed the Laboratory when he first came in May 1943. "We drove out from Washington, D.C., and I'd never been past the Mississippi before," he recalled. "Coming around the mountains from Las Vegas to Santa Fe, we went through strange clouds of showers, then sun, and the same week we saw snow. Joe Clements, who came with me from Maryland, was disappointed that the Rio Grande looked more like a creek.

"We came into town on a Friday. The road then was much different; it went to the base of the cliff then up switchbacks. When I came, there were MPs at the gate. When my brother Herbert came in March, there had been only a local man there with a shotgun. Things had changed in those few weeks. I thought the main technical area was too small to be anything. It essentially was a two-block area by Ashley Pond downtown. So we ended up near the mountains in the Western Area before we turned around and headed back."

Bridge had been interviewed by Dick Taschek, a former associate director who is now retired, at the University of Maryland where he had studied mechanical engineering for two years. He also had taken machine shop training during summer school as part of a national defense program. It was that experience which placed him in demand here.

"Joe Clements and I were to work at the cyclotron, but the clearance procedure held up the time and I was put into the main shop as a technician," Bridge recalled. In November 1943 the building was under way at Omega Site for criticality experiments and someone was needed to run the machine shop there under group leader Don Kerst—"at half the pay of a machinist!"

Since the dormitories were just being finished, Bridge was among those housed at the Big House, a lodging place inherited from the Los Alamos Ranch School. Unlike the previous students, who slept year around on unheated porches, Bridge was in an unheated upstairs room. "I concluded the boys had led a pretty spartan existence," he said. The mess hall, later converted to a civic club, stood nearby but is now gone, as is the Big House. Early wartime residents were able to use the billiard table downstairs and the canoes on the rack at nearby Ashley Pond.

"Coming here was a very good move for me," said Bridge. "You got to work with exciting people. I worked with the first, second, and third water boiler reactors. We had some of the first enriched uranium-235 ever made at Oak Ridge. Almost everyone worked six days a week, and many people put in extra time in the evenings. There was time for some fun, because Oppenheimer felt all work and no play wasn't good for you. The skiing activity, for instance, started during the first winter even though there was no ski slope then."

Bridge was one of the first property owners on Barranca Mesa after the government opened the area for private ownership in the early 1960s. He also was one of four men from K-Division who purchased the whole B-Building near Ashley Pond from the man who bid on it during part of the government's resettlement of the Laboratory. The cost was $500 each and a lot of labor, "the better part of 1959." The men built houses from much of the recycled lumber and 30-foot-high brick firewalls, which were pulled down with an old 1½-ton flatbed truck. The brick structures went for $1.

"I'm not sure we made out too well financially, considering the time spent, but of course nobody was too flush then," Bridge said. The bricks were from the old state penitentiary in Santa Fe and occasionally one would turn up with a prisoner's thumbprint on it; they were all handmade.

Bridge has memories of a Los Alamos different from what can be seen today. "We played softball just east of the Big House, in what was one long field leading up to it with the mountains in the background." The first stables were on Trinity Drive near a present-day professional building; they were moved to a semi-wet bowl-like depression near the present high school football field, and had one or two other locations before their present North Mesa home. A firing range was located near town but was moved into a canyon because people hiking in the nearby woods were afraid of being injured. The ski area, using volunteer labor from its first rope-tow days, was a good place to meet since people assigned to specific lab sites didn't often get to know their Los Alamos colleagues who worked elsewhere.

Bridge, who went back to school at the University of New Mexico in 1950 and then worked a year at Sandia Laboratories, recalled his military career. After WW II, he was drafted in the spring of 1946. "But, as with most who had worked here, you ended back at the Laboratory at your old job after less than a week off for processing. I wore a uniform, but nothing else was different. After 13 months of that, and living in the barracks, you were out of the Army. There were only a few occasions of KP during those months in the Special Engineer Detachment."

He said he'll probably retire in Los Alamos, which today has amenities nonexistent in 1943. "There really aren't any living hardships here today. Even during the war, we had Army bus service. But there was a six-month period, when we were working six-day weeks in 1944, that I didn't go off the Hill at all."

—Jeff Pederson

Photo file

Pat McAndrew: Being nosey was my job

The Laboratory's mail room, efficient and too easily taken for granted, has its roots with a remarkably strong WAC sergeant from Ohio who was sent to New Mexico in 1943 under secret Army orders.

Indeed, when she and her companions stepped from the gleaming Super Chief of the Santa Fe Railroad, the train station at Lamy, New Mexico, must have seemed a foreign country.

"I was the leader of two girls, which didn't make much sense to me. Why should I be picked over two others?" she asked. "We found ourselves on a train west. It stopped and we got out. As far as I was concerned, we were out in the middle of the desert.

"Our orders were to report to 109 E. Palace in Santa Fe, no place else, and that's what we did," she recalled. "Of course, it was on a Sunday and the office was closed, but we reported there."

She and her companions arrived in Santa Fe about 8:30 a.m. About 4:30 in the afternoon, an M.P. wandered by and suggested they come with him. McAndrews, with secret orders pinned to her brassiere, was going nowhere other than 109 E. Palace.

"After it was all straightened out, we came up to Los Alamos," she said. "I thought it was absolutely beautiful. I came from Ohio where we were not used to such landscapes." She quickly got used to that, but it took her a little longer to get used to Los Alamos' casual style.

"I was very military," she recalled. "The first time I met my CO (commanding officer), she was seated at her desk dressed in this red pajama-like outfit. I was in my neatly pressed uniform, and I was taken back."

She began her Los Alamos stint by managing 85 people and all the money that went through the Laboratory. She brought order, via the War Department decimal system, to the Los Alamos Manhattan Engineer District records.

"They were a mess," she said.

"I was always worried," she said, "because my instruction always came by telephone. I'd get a call and this voice would tell me to take the money, for whatever it was for, and meet a certain captain in Tesuque. I'd hand over the money and he would hand me a slip that said, 'received from A. Karam—$400,000,' that's all. My name was Karam back in those days. Like I said, I was very military and I'd take things too seriously. Here'd come this captain, hat cocked, and chewing a big wad of gum. I was always reluctant to hand such sums—and it was always cash—over to someone like that. My instructions were always over the phone. I had nothing in writing, but it always worked and I never got into trouble."

She said she was fortunate in having people who "believed in me.

"People have to have faith in you. I was hardnosed, but I thought I was fair. My people always came first with me and they worked hard, I think, in return."

Her devotion for "her people" carried over to her supervisor. She praised Bradbury for his leadership and organizational abilities, saying, "He was a nice, fair man. I would fight for him until the last end."

However, her devotion to duty probably caused more than one Laboratory person to grit his teeth and think, "McAndrew is at it again."

She would tackle the big with the small. It was more than one secretary, staff member, or division leader for that matter, who found their outgoing letters routed back to them with punctuation corrections and suggestions on how they might more clearly make a particular point.

They had McAndrew to thank for that. She read every piece of mail that went through her office; that meant all the mail that came through the Laboratory. She admits to having seldom been in the dark about any of the Laboratory's business. She knew about the Manhattan Engineer District's project, though many others involved didn't.

"I would have had to have been an idiot not to have known what we were doing here. After all, I read all the mail," she explained.

Personal letters looking for free Laboratory-paid postage always found their way back to their originator, opened and resealed in another envelope.

"It wasn't a matter of being nosy," she said. "That was my job. We were told the government would pay postage on all official business, not personal letters."

In the end they probably thanked her, though at the time they probably would have liked to see her working at another lab. Many of the people that worked for her said things like: "She was hard, but things got done under Pat McAndrew."

The current head of Mail and Records, Dave Heimbach, worked for McAndrew. He recalled, "If someone screwed up under Pat McAndrew, I'd walk them over to Personnel and that was it. You knew where you stood with her. I'll tell you one thing, if you had a personal crisis, you could go to her and she would help you. She was tough, mentally and physically, and she was extremely fair."

Mention her name to any of the oldtimers around the Laboratory and a smile will cross their lips. They'll sit and tell you their favorite McAndrew story and remember that one time when she was a particular thorn in their side, and they'll laugh and wonder what they would have done without her.

—Vic Hogsett

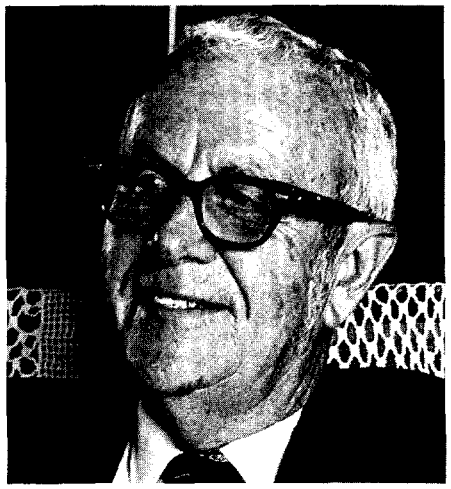


Photo by LeRoy N. Sanchez

Bob Porton: SEDs led life of Riley

By the end of WW II the military personnel in Los Alamos equaled the civilian population. What is less well known, according to Bob Porton who was in Army uniform then, is that Los Alamos had four military units, although the Special Engineer Detachment (SED) is the best remembered.

Porton went through basic training at Ft. Leonard Wood and found himself in Los Alamos in charge of recreation, working nights and weekends with movies, meeting hall schedules, dances, basketball, softball, a radio station, and a 9-hole golf course where the Western Area houses are now. After six months, his captain asked if Porton wanted a transfer from the Provisional Engineer Detachment (PED) to the SED. The other military components on the Hill were the MP security force and the WAC detachment.

"I said sure," Porton recalled. "Myself and two others were probably the only non-scientific SED members. SEDs worked in labs; some took part in the Trinity test. Gerold Tenney was a sergeant here and later became head of the Nondestructive Testing Group. Frank DiLuzio was here as a GI and later became an assistant director. At least some of the military who were here have held pretty responsible positions, both during and after the war."

Los Alamos was "somewhat easy" military duty, he said. The PEDs were for construction, finance, maintenance and other support functions. The SEDs were to support scientists in labs, and they seemed to skip most of the KP duty and garner more promotions. The PEDs and SEDs became one unit under the Army Corps of Engineers after the war's end, said Porton, who came to Los Alamos in December 1944 and was discharged as a tech. sergeant.

Secrecy, of course, played a large role in Los Alamos for more than two years. "I knew there were strange and exciting things going on up here for the war effort, and I had scientific friends in the band I played in, but I didn't know any details. I did once get out of a tongue-tying situation on a furlough in April 1945 by saying to a former commanding officer that I was working at Brun's Hospital for tubercular military patients in Santa Fe. Actually everyone in the area, including the Santa Fe media, respected the fact that we were at war. If anyone knew anything, they kept it to themselves."

Porton was scheduled to go to the July 16, 1945, Trinity test. But others decided that station KRS, from which he broadcasted, should be on the air. George "Tom" Fike and Porton operated the station from noon to 1 p.m. and from 5 p.m. in the evenings. Their noon program was called "45 minutes of music at lunchtime with Tom and Bob." The format included platters, puns, jokes, community news and corny humor. Until Jan. 1, 1947, the station operated from the wooden Big House; it later moved to a Central Avenue building and eventually, as KRSN, to North Mesa.

"People would sometimes come in," Porton recalled, "because we were allowed to have an antenna and others were not. We'd feed the KOB news with Bob Lloyd from Albuquerque at 12:30 with their permission, although we were not under FCC license or jurisdiction then.

"This particular day, a number of scientists, and more, and more, up to 40, came in, and we let them into a studio room, because there were so many. The opening news story was the ammo dump going up in Alamogordo at the air base. The scientists all lit up and talked excitedly and left. This scheme enabled them to know the Trinity test was successful. Phil Belcher of the documentary division had drafted the fake press release and put it out to the Associated Press.

"I would have loved to have been there.... I always wished they'd have let old Tom run the station that day," said Porton.

After the war, the radio station and the recreation department got better equipment and more staff, 11 persons in the case of KRS, where Porton worked until 1956 (it went commercial Dec. 9, 1949). He has been, and still is, the Civil Defense director for Los Alamos County, but that's another story.

In prewar days at the University of Florida, Porton had run a dance band but abandoned his drums in Tampa when he went into the service. Later he found there was a Los Alamos band with a drummer who was really a piano player. "One night they'd put together a set and asked me to sit in with the 15-piece Keynotes," he recalled. "We also had a smaller Sad Sack Six that played around town at smaller gatherings. Probably the Keynotes' most famous dance was the September 1945 big ball for the Santa Fe Fiesta. Hal Fishbine, leader of both groups, is still here."

Porton, who is the official LASL historian and the associate Public Affairs Department head, also handled the physical education program for Los Alamos High School during the war. "For a GI, this town was super," he concluded. "We didn't have a real rigid military life compared to other places. The SEDs led the life of Riley."

—Jeff Pederson

L.D.P. King: We mixed uranium soup

Photo by Jeff Pederson

L. D. Percival King received a Ph.D. from the University of Wisconsin in 1937, became an instructor at Purdue, and by the onset of World War II was in charge of the cyclotron machine there. He said, "We didn't know what was going on, but one day J. Robert Oppenheimer visited us. He was interested in making use of the cyclotron for some secret experiments. These were done in 1942 and '43, with a guard at the door; not even the head of the department was allowed to come in."

Later, John Manley came from the Met-Lab in Chicago to ask King if he and others would go to New Mexico for a vague-sounding project at a "former school site" near Santa Fe. King still has a WPA Series Guide Book to New Mexico he read for clues prior to October 1943, with a description of the Los Alamos Ranch School marked in pencil.

What followed, King said, was "probably the most exciting time in my life. Working on the frontiers of science with some of the world's top scientists, in beautiful surroundings, was very much to my liking." He was assigned to work under Don Kerst, who had received his Ph.D. at the same time at Wisconsin, and had since designed the betatron machine. The group was first intended to be "senior trouble-shooters" but ended up as the "Water Boiler Group," working on determining experientially how much enriched uranium was required to make a critical assembly.

It was most important at this time to find out how well theoretical calculations could predict a critical mass. Buildings were constructed in Los Alamos Canyon; at one time machine guns were posted on two towers; small amounts of U-235 began to be received from Oak Ridge. "The stuff was fantastically valuable. Charlie Baker, the only bachelor in our group, often used to sleep at the site to assure its safekeeping.

"It was decided to make a uranium sulfate solution, or 'soup,' as we called it, for the experiments. This solution was mixed with a beater in a conical-shaped pan, whenever new material became available, and was pushed up into a one-foot diameter sphere which was inside a beryllium reflector. Radiation detectors placed around the experiment showed how near to criticality one was. It took months to get enough uranium from the separation facilities at Oak Ridge to reach criticality. Enrico Fermi took the assembly to that stage when he withdrew the 'poison rods' from the beryllium moderator.

"Later a reactor was designed based on this assembly which was to be used as a strong neutron source. Ours was the world's first reactor using enriched uranium; this Water Boiler ran for many years and was used for a number of important experiments. It was probably the simplest reactor to control ever built: you could turn it on in the morning in minutes, and off again at night," said King.

It was surprising to most people, he remarked, how rapidly Los Alamos was able to develop into an advanced laboratory. This was because research groups from Wisconsin, Purdue, Princeton, Berkeley, and others were brought bodily to Los Alamos, in many cases with their scientific research machinery.

"In fact, some people who left after the war, wanting to return to the good old days, found things had changed, and came back to New Mexico in the late 1940s. I almost left for the University of Chicago, at the request of Fermi, but we couldn't find a decent house, and besides, I like the outdoors! It seemed hard to take a big-city environment after having lived in Los Alamos! Fermi used to talk about making Los Alamos a university town, which sounded like a great idea. It did seem foolish to just leave all the equipment and talent that had been assembled there. For a time, it was psychologically difficult to stay when you saw people leaving that you liked and had worked with."

King is also remembered as the builder of what was later termed the Fermiac, an early mechanical computer built from Fermi's ideas. It rolled over paper on four wheels to do complicated computations; it preceded electronic computers. The device is now exhibited in the LASL science hall.

Among other things, King later served as technical director for the United States Delegation at the U.N. Conference on Atoms for Peace in 1958. He was research adviser on the Los Alamos Director's staff when he retired in 1973. He is now living with his wife, Elizabeth, on a ranch in Tesuque. He can look back and know he was one of those who had a part in moving the world into the atomic age 35 years ago.

He said, "If we had first used nuclear energy in a reactor, instead of making a bomb, we would probably now be much farther along the road toward public acceptance of nuclear power. Unfortunately the words 'nuclear' and 'atomic' became linked in the public mind with bombs, and 'radiation' became a fright word to people without enough background in physics to understand it.

"People who are against the use of nuclear power are worrying about possible effects on future generations a thousand years from now. They don't seem to worry about the dangers of burning up valuable chemical resources and polluting and changing our atmosphere by the use of a lot more coal-burning plants. If this happens, there may not be any future generations a thousand years from now."

—Jeff Pederson

"Manhattan..."

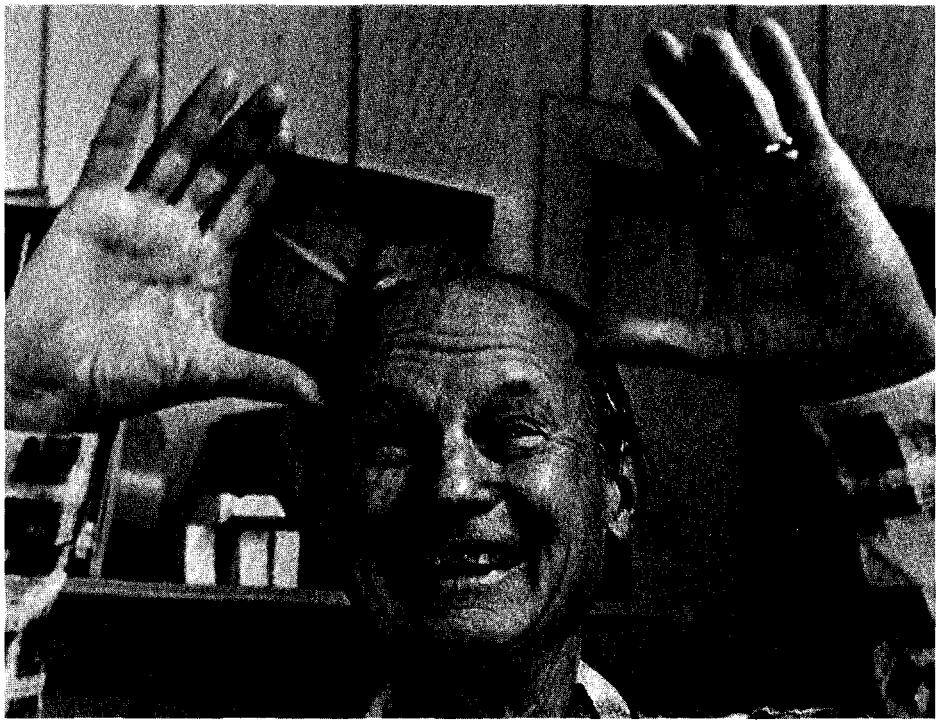


Photo by Bill Jack Rodgers

Berlyn Brixner: I'm supposed to be the photographer

It was not his first trip here, but it may have been the one that impressed him the most. Berlyn Brixner had leveled his camera on the Ramon Vigil Land Grant several times as a photographer for the United States Soil Conservation Service. He had visited soil conservation work sites and knew about the boys' school. A call from a boyhood friend, and a brief drive from his home in Albuquerque, got him started at Los Alamos on the most exciting project of his life.

While here he improved the performance of an early high-speed frame camera and later came up with a couple of his own. One was capable of exposing at a rate of 3½ million frames per second. The other is still in use after nearly 30 years. A nice achievement for a man with some college training, but no degree, working with renowned scientists of the time.

That early phone call in May 1943 was from Dave Hawkins, a Laboratory staff member and a fellow El Paso native.

"He started by saying, 'We have a military camp out of Santa Fe and need your photographic know-how,' " Brixner remembered. "He wanted to know if I wanted to get into war work."

"My family and I fitted very easily into a 1943 temporary war camp," Brixner said. "We lived very well here. There were really no hardships. You must remember I was raised in El Paso and had many times worked out of Civilian Conservation Corps camps. I guess we were used to a rough life.

"Soon I was interviewed by Julian Mack. Julian was working on a high-speed camera," Brixner continued. "He showed me the plans for this camera. I looked at them and said, 'I'd like to work on this project.'

"It turned out that this camera—a chronograph sweeping-image camera—wasn't completed by the shop until three months had passed," said Brixner. "In the meantime, I operated the photostat and blueprint service, thus relieving a physicist who had been doing that work.

He had no idea how the camera fitted into the project. When he was told to figure ways to mount the camera in an Anchor Ranch bunker, the pieces began to fall gradually into place.

"They told me a few months later what they were working on," he added. "It didn't come as a big surprise. I had read a little article in Colliers Magazine about how this fission process could be used to build a bomb."

The project's goal in mind, Brixner set about his tasks under Mack's direction. One of his next assignments was to learn how to use a professional motion picture camera; a novel assignment for a still photographer but an opportunity for Brixner, who later ran the motion picture coverage of the Trinity event. For this task, he said, he was placed in the hands of a Navy motion picture crew at Muroc Air Base in California.

"I learned how to use one of those cameras by filming dummy bomb drops. I was out there with a Navy crew; they were very good, but they didn't tell me much. I guess it was a kind of professional jealousy. But I practiced and eventually got to where I could track a bomb from the time it left the plane until it gained too much speed for me to keep it in the field of view."

Next were many months of preparations for Trinity. Brixner spent some hours converting two machine gun turrets to camera mounts. A large number of commercial movie cameras were installed in four bunkers. They ranged in speed from one frame per second to about 10,000 frames per second. There were also new photometric and spectroscopic cameras that Mack had built at Los Alamos specially for Trinity.

As time grew short, Brixner said, it became obvious that the teams would not be able to get all of the cameras they hoped to put into operation.

"We had to cut our plans short in order to concentrate on the cameras we could get running," he said. "We just couldn't complete all of the new cameras. We had 30 to 40 cameras at Trinity at the time of the explosion." He said they included 16mm and 35mm motion picture cameras, Fastax high-speed cameras, twin Aero cameras (synchronized and mounted

for stereoscopic images), spectroscopic cameras, and still cameras. All were operated by signals from the central control station.

"Nobody knew how big the explosion would be," Brixner said. "Each revised estimate increased. When it got close to the end they were talking about 10,000 tons of TNT. Earlier we had photographed a 100-ton TNT explosion—not much when compared with the July 16 event.

"We had been told not to look at the blast, but of course some wanted to see it from the start. Julian provided dense welder's glass filters and these proved satisfactory," Brixner said.

"When that bomb went off the light was blinding to our dark-adapted eyes, even after it passed through the dense filter," he said. "There was first a countdown that started out with hours; then it was two hours, an hour and a half, and finally seconds. The explosion flash seemed to shine like the sun. The public address system went absolutely silent; seconds went by and still silence.

"The ball of fire grew, and I thought it would never stop. It then started going up and soon was going out of the viewfinder of the camera I was operating. That is when I came alive and started following the ball of fire with the camera. 'I'm supposed to be the photographer,' I thought to myself, 'and here I am letting the thing get away.' "

The photographic coverage was good, although one Mitchell camera got rained on and burnt itself out, and another had been knocked out of alignment.

"But even that film proved to be good," Brixner said, "because the camera was pointed at two barrage balloons blowing up about a quarter of a mile from ground zero. We got excellent coverage of the balloons caught in the explosion."

After the films were collected from the cameras, Brixner took them to the Wendover, Utah, air base where they were processed.

"We had little idea how they should be developed," Brixner said. "I gave the processors one roll of film thinking we could make adjustments on the other two. The first roll was quite satisfactory, and I told them to process the other two the same way. Shortly after Hiroshima we got a message from General Leslie Groves (Manhattan Project head)," Brixner said. "He wanted the 35mm footage in Washington as soon as possible. I took them there, and Groves sent me to the Naval Motion Picture Laboratory for the preparation of master negatives. There we ran into another problem."

Brixner said the films proved to be very dense at the start of the rolls and then faded to almost nothing toward the end.

"I told the chief there about all this, and he just looked at me and said, 'Can do.' Those Navy people did an excellent job of printing. They knew just how to handle special problems."

With his original three rolls now duplicated, the films were ready for release to the news reels—which General Groves did.

"They were in the theaters' news reels within a week for everyone to see."

With the war over, many of Los Alamos' residents were beginning to think back to the jobs they had left. Professor Julian Mack returned to the University of Wisconsin, leaving Brixner in charge of the Optics and High Speed Photography Group.

"I studied reports about high-speed camera problems and accomplishments," Brixner said. "By 1949 I was able to undertake the improvement of a wartime high-speed frame camera that produced pictures at the rate of 400,000 frames per second, at the request of Wayne Campbell, the GMX-8 (Explosion Research) group leader. Minor revisions of the optical system and a faster rotating mirror gained us a fourfold increase in speed along with better picture quality."

This work led Brixner to propose a camera of his own design to make still larger high-quality pictures at a rate of about one million photographs per second. This camera (MOD-1) was very successful and is still in use today. It became the prototype of the most popular commercial explosion research camera.

"It is well to remember," Brixner added. "that the inventor of the first rotating-mirror frame camera was C.D. Miller working at the research laboratories of the National Advisory Committee for Aeronautics in 1936-1938. Subsequent cameras are just improvements on that idea."

The next step in Brixner's improvements came following a 1950 LASL Coordinating Council meeting.

"Edward Teller requested me to photograph the 'Super'—the hydrogen bomb explosion—in the millions of frames per second rate," Brixner said.

"I did work out a scheme to solve that problem and built cameras that photographed the 'Super' explosion at a rate of 3½ million frames per second," Brixner said. "That camera also became the prototype for a commercial camera."

Over the next few years, Brixner and his optics group worked on perfecting the original design of the Brixner Camera. This work culminated in a camera capable of taking 15 million photographs per second, using 35mm film processed normally. This Los Alamos MOD-8 camera was housed in a rugged cast aluminum frame. It was light enough to be carried easily and could be operated by one man. However, it was too fast and very difficult to synchronize with the explosion being photographed.

To augment his group's work in camera design, Brixner also developed many lens designs and a computer code for designing complex optical systems.

He was honored for his camera inventions in 1966 when he received the E.I. duPont Gold Medal Award from the Society of Motion Picture and Television Engineers. It was some years later that he helped to have C.D. Miller given a similar award.

—Vic Hogsett

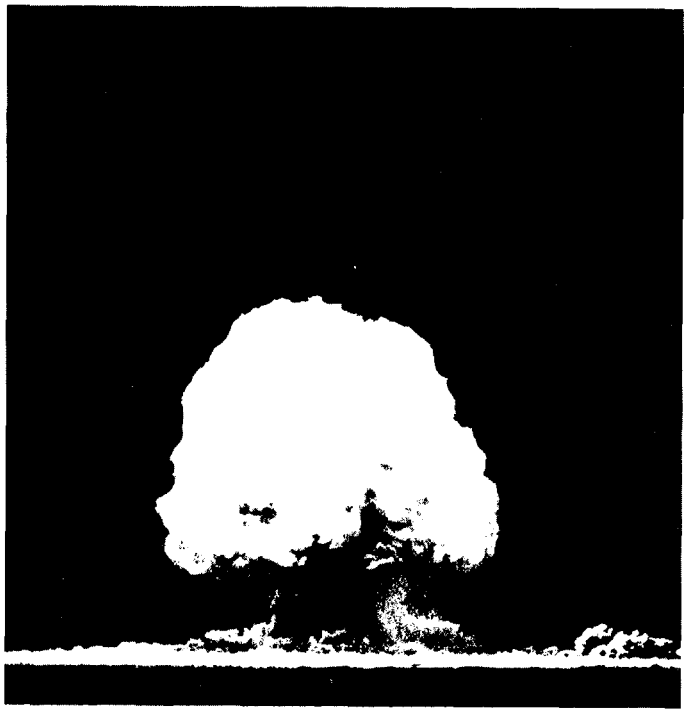
Crossroads to the sun: **a time table**

Here are a few datelines from LASL and national history, taken from period publications and documents. More weight has been given to the earlier years of the Laboratory:

January 1943: The University of California will operate the Project Y part of the secret Manhattan Engineer District. Facilities of the Los Alamos Ranch School are vacated; by spring the military and civilian arrivals will far surpass the 100 or so predicted previously.

July 16, 1945: The world's first atomic bomb was detonated in the desert of southern New Mexico.

August 1945: Hiroshima and Nagasaki are bombed with the second and third atomic devices. Japan agrees to surrender Sept. 2.



March 1946: There is a $750,000 project to bring in water from Valley wells, ensuring a permanent water supply from the Rio Grande aquifer... Men are off to Bikini for Operation Crossroads weapons tests... The housing office says there are pet problems in the dorms.

April 1946: The Zia Co. takes over maintenance operations from the Army... Harold Agnew recounts the Hiroshima flight over KRS (Los Alamos) and KOB (Albuquerque)... Philip Morrison tells his version on KRS and KOB.

May 1946: Free medical and dental care ends for civilians... Permanent housing is planned... Eight are hurt in radiation experiment—Louis Slotin, Canadian, will die in a few days from massive burst of gamma rays—the room turned blue from ionized air particles.

October 1946: Country club gets go-ahead... Two supermarkets will open... Elections for advisory town board.

January 1947: Los Alamos now under the Atomic Energy Commission (AEC); the Manhattan Engineer District no longer. J. Robert Oppenheimer will chair AEC presidential advisory committee. All because of 1946 "McMahon" Atomic Energy Act.

November 1947: The Hill changes from manual to dial telephones.

December 1947: Question whether Los Alamos residents are state citizens will go to New Mexico Supreme Court.

January 1948: First bank opens in town.

March 1948: Bridge being built over Rio Grande to Pojoaque, next to prewar suspension structure. It's the state's longest single span.

May 1948: High school graduates 30.

July 1948: Los Alamos Times will suspend publication; government says it can't accept advertising and its pictures need official approval... Zia charging $1.75 per 1,000 sq. ft. for lawn upkeep... Poll says most residents don't want public bars.

December 1948: Aid to Free China considered... Berlin Blockade in news... French are seeking their own atomic power... It's proposed to form Los Alamos/Espanola county since Hill residents travel 85 miles to Bernalillo... White Rock will spring up as construction camp for contracting employees; there will be 367 homes, 21 dorms, and 200 trailers on 240 acres once part of Ramon Vigil grant.

January 1949: U.S. House bill calls for state jurisdiction over The Hill since state courts say residents on federally condemned land aren't state residents.

March 1949: First electricity from atomic pile at Oak Ridge, Tenn.

April 1949: Civil Service Commission says residents can run for office, contrary to Hatch Act... Lists of "sympathetic" artists and Communist card holders are published first in New York, then elsewhere; House Un-American Activities Committee looking into "potential influences."

June 1949: Los Alamos becomes state's 32nd county and will have its own commissioners, after Congressional and state legislative action.


The City of the Scientists

Los Alamos Times

On the Frontier of Research

Vol. 1, No. 16 LOS ALAMOS, NEW MEXICO, FRIDAY, JUNE 25, 1948 Distributed Free

Bikini Test to Climax Work Done Here

New Hours Effective Monday

Hill Men Ready at Drop Site

Details of Slotin Death Accident Are Disclosed

Water Crisis Seen Eased

Bair Leaves Commissary

Bikini Crews Trained to Field

Task Force Chief

July 1949: Henry Snelling, suspended AEC information director here, turns himself into the Dallas FBI office and ends espionage rumor; he'd allegedly left town with $1,000 collected for Red Cross fund drive.

February 1950: Klaus Fuchs trial under way in London and he later serves 9½ of 14 years... Truman says yes on the H-bomb.

March 1951: David Greenglass, Army sergeant here in war, testifies in New York spy case... Julius Rosenberg, 34, and wife Ethel, 35, sentenced to death for passing to Soviets Los Alamos secrets; Martin Sobell, 33, gets 30 years.

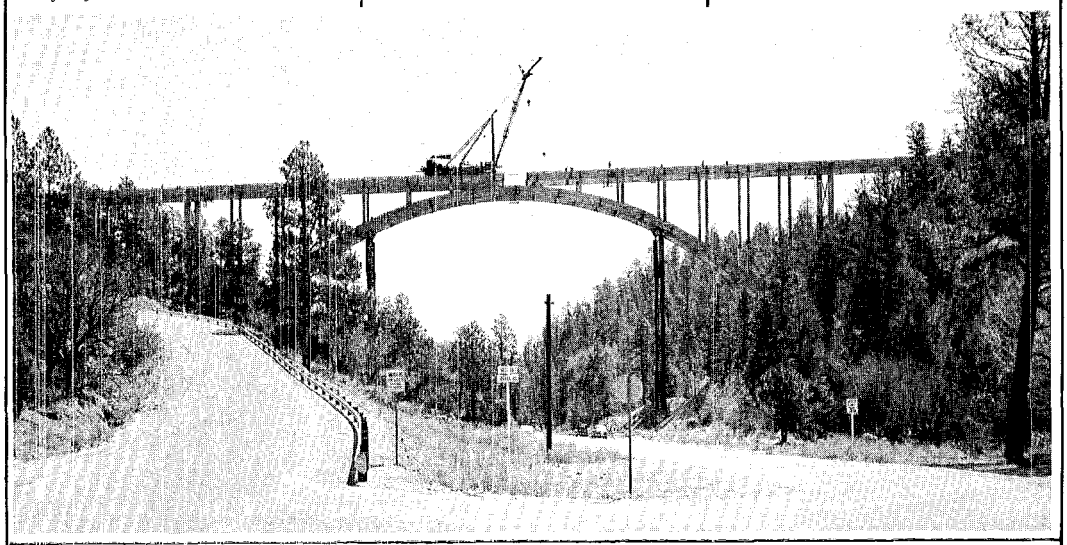
May 1951: Last steel going into new canyon bridge to new technical area.

December 1951: Postmaster is out on charges of misusing funds and falsifying records... AEC policy does away with some home businesses.

October 1952: First thermonuclear blast, Mike shot, set off in Pacific; elements 99, 100 found.

1957: The town's gates come down and it is an "open city"; an AEC survey had shown most residents were against it... Scylla I produces first proven controlled thermonuclear reaction; later goes to Smithsonian.

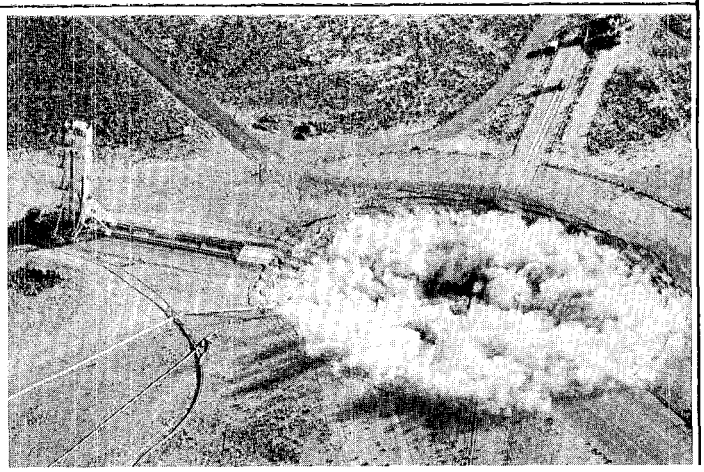
December 1958: Project Orion, short-lived program to investigate sending rockets up with a series of atomic blasts as propellants... Part of old technical area being torn down for new homes on Barranca Mesa.



June 1951: Al Graves, LASL, reports to country on Enewetak tests... AEC says no to second theatre... 70,000 casualties after a year's Korean fighting.

July 1951: Nevada Test Site (NTS) receives official status after activation in January as on-continent testing ground.

August 1951: 22 gambling machines seized in Legion raid... New bridge opens.



Crossroads to the sun: **a time table**


THE NEW MEXICAN

LAPRE-II Successful

Small Gold-Clad Reactor In Operation At Hill Laboratory

Tibet Revolt Spreads Thru Mountain Land

LOS ALAMOS NEWS IN BRIEF

April 1959: LAPRE reactor tests; designed to make electric power and space heating for a small isolated settlement.

July 1959: Permanent colony for Project Rover, nuclear rocket engines, in Nevada.

August 1959: Charged particles evaluated with LASL's first space probes.

September 1959: Scylla project for magnetic fusion research under way.

January 1960: Unique Turret reactor to be built with unclad fuel elements; may pave way for heat process for synthetic fuels.

October 1960: U.S. system to detect nuclear detonations from outer space is unveiled... Within two years, 15 to 20 Vela Hotel satellites with LASL instruments will be launched.

November 1960: At least six sites will receive copies of LASL's Godiva reactor, so named because the original core of enriched uranium was bare. Produces powerful bursts of fission neutrons.

April 1961: Stretch computer due here; called world's most powerful.

August 1962: U.S. Senate passes "disposal" bill, and House action expected: Will make private ownership of property legal here.

DISPOSAL OF THE LOS ALAMOS COMMUNITY

HEARING

BEFORE THE

SUBCOMMITTEE ON COMMUNITIES

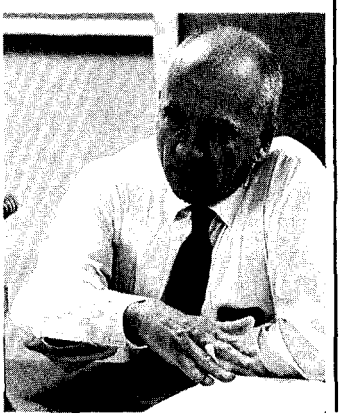
OF THE

JOINT COMMITTEE ON ATOMIC ENERGY

CONGRESS OF THE UNITED STATES

June 1963: After 20 years, the Santa Fe office at 109 East Palace Avenue is closing.

August 1963: Director Bradbury testifies in support of the Limited Test Ban Treaty before the Senate Foreign Relations Committee.



February 1964: Big year for Rover, nation's nuclear rocket program... World's largest tandem Van de Graaff accelerator is ready after 3½ years of building and testing.

September 1964: AEC will spend $13 million for construction at Laboratory and town this year... Last of original downtown lab area is razed.

May 1966: Two planes crash during refueling over Palomares, Spain, and four hydrogen bombs are recovered after ground and ocean search. Wright H. Langham, health physicist, is involved in project.

October 1966: LASL designated a national historic landmark.

June 1967: $17 million in public lands, roads, buildings transferred from federal to county ownership and Municipal Building dedicated... Excavations for LAMPF meson factory.

October 1967: Stan Ulam, staff member since 1944 and thermonuclear weapons theorist, retires and will become chairman of the mathematics department at the University of Colorado.

November 1967: Hans Bethe has received the Nobel prize for physics, and with it $62,000 and a gold medal. He is a Cornell professor and a LASL consultant; he led the Theoretical Division here in WW II.

March 1968: Tests of components on the Ultra-High Temperature Reactor Experiment have been carried out, and additional cold critical experiments are being conducted. UHTREX went critical last August.

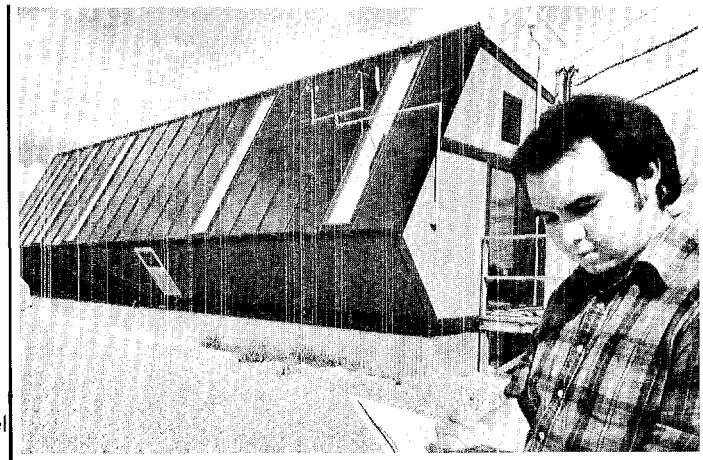
August 1968: At the Nuclear Rocket Development Station in Nevada, a fiery plume reached nearly 400 feet up as Phoebus 2A generated more than 4,000 megawatts, operating as a rocket reactor at almost 2,000 degrees C.

April 1969: Carbon-13 should cost less thanks to a new production facility at CMF-4. The isotope is magnetic and detectable in organisms.

July 1969: Noted science author Samuel Glasstone will move to Tennessee this fall where he will work at Oak Ridge. Recently remarried, he has been at LASL since 1951.

September 1970: Norris Bradbury, Director since 1945, is resigning; his place is being taken by Harold Agnew, W-Division leader.

December 1971: The first field tests of Subterrene, a rock-melting boring device, have been made.



April 1976: A solar-heated prototype home is being installed at TA-46. It will be studied for performance of flat plate panels and heat storage.

October 1976: National Environmental Research Park designated here.

August 1977: The Department of Energy will take over from the outgoing ERDA later this fall.

May 1972: Eight employees die when a Ross Aviation Queenaire crashed shortly after takeoff in Albuquerque.

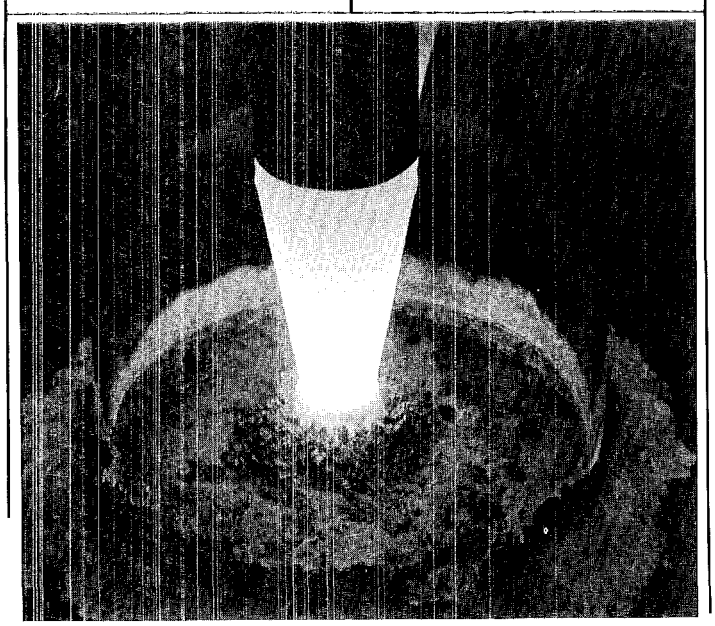
March 1973: AEC has declassified 166,910 documents in accordance with Executive Order 11652 over a five week period.

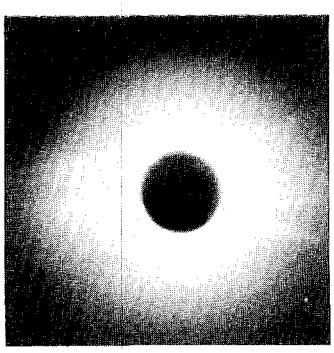
February 1974: LASL now has the world's most powerful CO_2 laser system. A two-beam laser will operate at 2,500 joules and a larger eight-beam system is planned.

January 1975: The AEC is out, by Congressional action last fall. The new Energy Research and Development Administration will take over AEC functions, along with the Nuclear Regulatory Commission.

January 1978: LASL sent men and equipment to the Canadian Northwest Territories following the crash of a Russian Cosmos 954 satellite that was powered by a uranium-fueled reactor.

July 1979: New Director Don Kerr has assumed his duties, succeeding Harold Agnew who went to General Atomics. He was Acting Assistant Secretary for Energy Technology at the DOE.





March 1980: Experimenters rendezvoused in Kenya for a flight along the path of solar eclipse totality over the Indian Ocean.

May 1980: First electricity from hot, dry rock project in Jemez Mountains.

Home to Enewetak

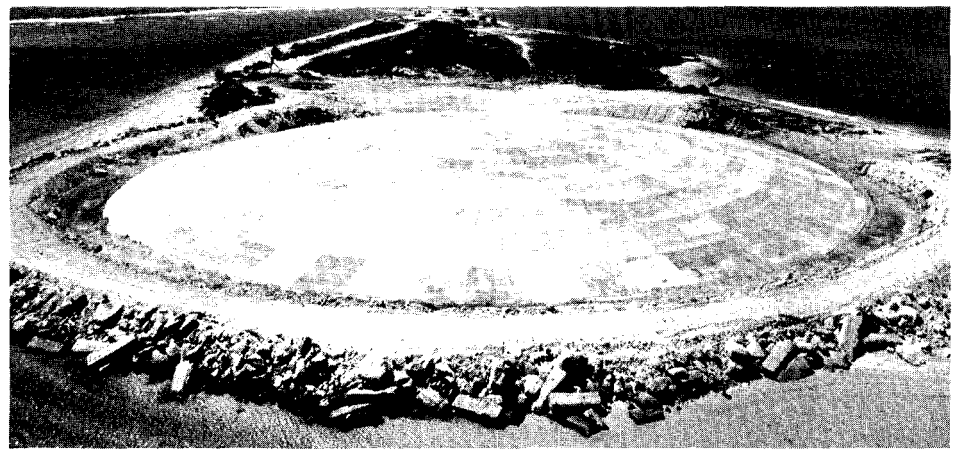
BY JOHN HOPKINS AND ROSEMARY HARRIS

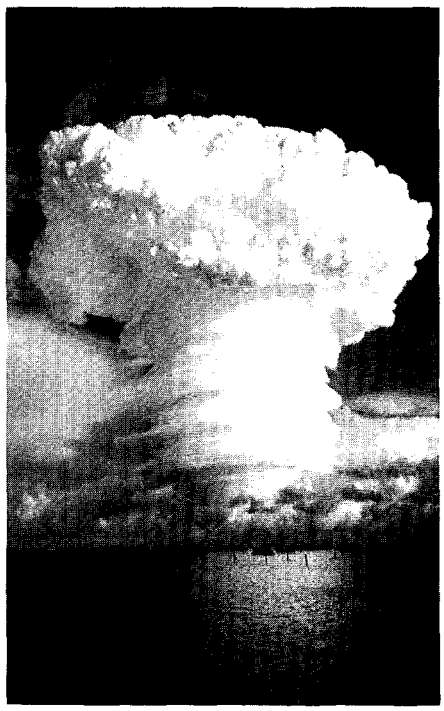
On April 8, 1980, United States officials observed the return to the people of Enewetak of their atoll that in 1947 had been made part of the Pacific Proving Grounds. During the past 33 years the Enewetak people have been living on the much smaller Ujelang atoll 125 miles southwest of Enewetak.

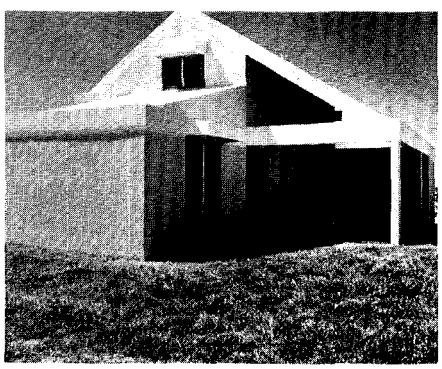
There were 43 nuclear weapons tests conducted at Enewetak (spelling preferred by residents) in the decade between 1948 and 1958. The most famous of these was the Los Alamos Mike event on October 31, 1952, the world's first thermonuclear device with an energy release 1,000 times that of the Hiroshima explosion. This device, detonated on the surface of a small island, completely vaporized the island and left a deep crater in the coral. A considerable amount of rubbish resulted from the test operations. Most of it was in the form of abandoned buildings, twisted wreckage of scientific hardware near the explosions, and some radioactive debris from the nuclear weapons. It was because of the dangers of the radioactivity and because of the uncertainties in the evolution of the atoll following the cessation of nuclear testing 22 years ago that the islands were off limits to the Enewetak people.

Enewetak is in the Marshall Islands, one of the major island groups in Micronesia. It is 2,700 miles west-southwest of Hawaii. The atoll is roughly circular in shape with a radius of about 10 miles. Though considered large as atolls go, the total land area of the approximately 40 islands that make up the atoll is only two and a half square miles. With the exception of two underwater shots, all of the

Home to Enewetak







Clockwise, from lower left: One of six new housing types built for returning inhabitants. Oak Shot from June 1958. Debris is capped in Cactus crater on Runit Island. Japtan Island with coconut palms planted in rows on far side. Chief Johannes Peter and his wife. Photos by John Hopkins

nuclear weapon testing was done on or near the north and northeastern islands. Some tests were conducted on the island surface, some on towers, and several on barges in the lagoon. The experimental stations were located in bunkers or towers on the same islands or on nearby islands. The scientific headquarters and living area were on Medren Island to the southeast, while the main support facilities were located on Enewetak Island in the south.

In early 1972, after much soul-searching and interagency discussion, it was concluded that the atoll could, and should, be cleaned up and returned to the Enewetak people. The first task was to determine what was to be cleaned up, in the form of twisted wreckage, buildings, miscellaneous junk, and radioactive debris, especially the transuranic elements. Although the fission products, notably cesium-137 and strontium-90, present the greatest health risks in the near term, natural decay of these short half-life elements will continually reduce that hazard. Then the task was to perform the cleanup with appropriate disposal of the radioactive material and, finally, reestablish the island's homes and trees that are used for food and for cash crops, such as copra.

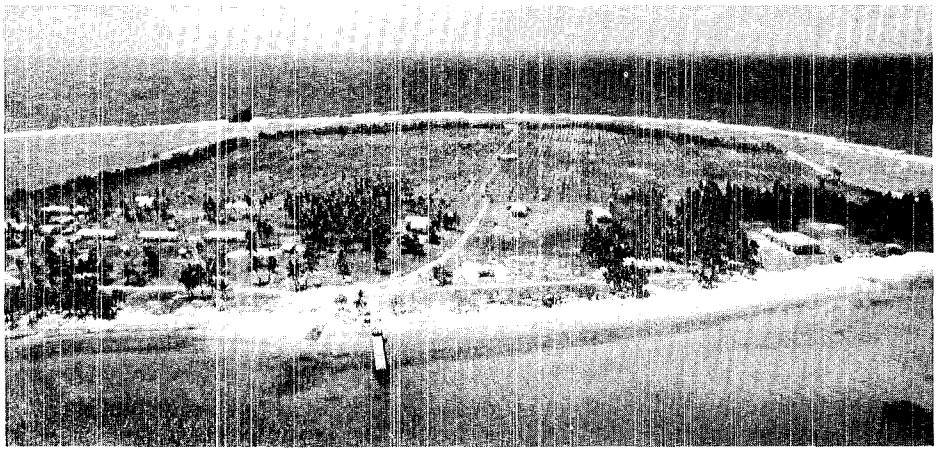
After much planning and discussion with the Enewetak people, the cleanup was started in 1977 by the U.S. military under the direction of the Defense Nuclear Agency. The DoE had the responsibility for radiological advice and for the identification of the radioactive areas while the Department of the Interior had the responsibility for the resettlement of the natives from Ujelang to Enewetak.

The Los Alamos Scientific Laboratory contributed technical support, especially in health physics, to the Nevada Operations Office which had the DoE responsibility for operations in the Pacific. During this period, Dick Smale and John Gallimore of H-1 spent tours of duty on the atoll.

After three years, the more than 4,000 dedicated members of the cleanup and rehabilitation crew had completed the disposal of the scrap and of the radioactive debris. Much of the uncontaminated wreckage was disposed of in deep sections of the lagoon while the radioactive material was sealed in concrete in the crater from the Cactus event. Only one small barren island could not be rehabilitated to acceptable standards. That is the island of Runit and it will remain forever off limits. Although any real estate is precious in the Marshalls, the people have accepted this necessary restriction.

In the early days of the cleanup, a partial return was arranged whereby about 70 of the Enewetak people were permitted to return to the southeast island of Japtan. This small, early-return population was rotated several times during the cleanup so that perhaps half of Enewetak's people had the opportunity to become familiar with their ancestral home.

During the cleanup operation Holmes and Narver, the major support contractor, designed new houses for the returnees. There were six basic designs, incorporating the cultural features desired by the people themselves. Each family was invited to select the style and location of their home on the islands of Japtan, Medren (Parry), or Enewetak. These are well-designed and well-built structures requiring a minimum of maintenance. In addition, churches, meeting houses, and schools were constructed or modified from existing structures. The craftsmanship was of



the highest quality and the area was completely cleaned up and replanted.

For the April 8 ceremony, the families remaining on Ujelang were transported to the Enewetak atoll for the return ceremony. One hundred and thirty-six people had been moved off Enewetak in 1947 and there were about 450 moved from Ujelang to join the 70 already at Japtan. There was great excitement and enthusiasm on the part of the people, some of whom were seeing the Enewetak atoll for the first time.

Over nearly a decade of discussion, planning, cleanup and rehabilitation, very close bonds were developed between the Enewetak people and the U.S. participants. As a small token of their friendship, two bells were presented to the Enewetak people for their churches on Medren and on Enewetak, at the ceremonies on the islands. Unveiled at those ceremonies were two plaques with the following inscriptions in Marshallese and in English:

The bell in this church tower
was presented
to the people of Enewetak
with gratitude and admiration
from the cleanup and rehabilitation force
on behalf of the people of the
United States of America
April 1980

Following the presentation of the bells, the completion ceremony was held in front of the new Enewetak church with addresses by the High Commissioner of the Trust Territories of the Pacific, Adrian Winkel; Chief Joannes Peter of the dri Enewetak (the Enewetak People); Chief Binton Abraham of the dri Enjebi (the Enjebi People from northern Enewetak atoll); Vice Admiral Robert Monroe of the DNA; Assistant Secretary of the DoE, Ruth Clusen; and others. Adm. Monroe noted the important contribution of the people of Enewetak to nuclear weapons testing and, hence, to the security of the free world. This was followed by a formal proclamation signing and a brief Enewetak church service.

After the Enewetak return ceremony, which ended around 7 p.m., all of the participants were treated to a sumptuous island dinner including crabs, poi, and other local dishes. The festivities of the day, the excitement of the return, and the large meal put everyone in a celebrating mood and we were treated to native dances and songs that started out in the dining area (the old Tradewinds Club) and continued there until midnight when the participants gradually started to drift out to other parts of the island where impromptu singing and partying continued throughout the night. In the late morning fond farewells were exchanged and we were bundled into an Air Force C141 for the long flight home to Honolulu via Wake Island.

We can take satisfaction in the outstanding cleanup and rehabilitation program at Enewetak. To the maximum practicable extent, the islands have been restored and now, in the words of Joannes Peter, the 85-year-old traditional chief, the people "are returned to live on the land upon which God ordained that they should live." The small amount of residual radiation on some northern islands will impose few restrictions upon the peoples' life style. The people of Enewetak have made a great sacrifice which has been of immeasurable benefit to world security. We may now hope and pray that they will find peace, good health, and happiness as they return home.

(Hopkins is deputy associate director for test and verification; Harris is associate director for administration.)

"Returned to live on the land upon which God ordained that they should live."

We've been asked several times for a genealogy of technical divisions. Information presented here and on the accompanying chart is from LASL records. There may be some gaps or inconsistencies:

A: Assay and Accountability, 1970, from N-6, W-7, ADPSF. Most went to R, 1975, when disbanded.

AP: Applied Photochemistry, 1976. From L and CNC.

AT: Accelerator Technology, 1978. From P and MP.

B: Assembled for Operation Crossroads in 1946 and disbanded.

C: Chemistry, 1943. To CM in 1944.

C: Computer Science and Services, 1968, from T. A group to M, 1976.

CM: Chemistry and Metallurgy, 1944, from C. To CMR, 1945.

CMB: Chemistry-Materials Science, 1956, from CMR. Formerly Chemistry-Metallurgy (R.D. Baker). A group to P, 1970. A group from CMF, 1971.

CMF: Chemistry-Metallurgy (R.D. Fowler), 1956, from CMR. Folded into CMB, CNC, P in 1971.

CMR: Chemistry and Metallurgy Research, 1945, from CM. Split into CMB and CMF in 1956.

CNC: Chemistry-Nuclear Chemistry, 1971, from CMF and J. A group to AP, 1976.

CTR: Controlled Thermonuclear Research, 1974, from P and Q.

E: Engineering and Ordnance, 1943. Split to O and X, 1944.

E: Electronics and Instrumentation, 1972, from N, P, ENG. Became Electronics, 1974.

EP: Experimental Physics, 1943. Split to G and R in 1944.

F: Theoretical Physics and Nuclear Physics (E. Fermi), 1944, from T. Folded into P and T, 1945.

G: Gadget, 1944, from EP. Went to M and X, 1945.

G: Basic and Applied Geosciences, 1977, from Q and J. Part from J, 1979.

GMX: Explosives Systems and Implosion Dynamics, 1948, named from G, M, and X. A group to K, 1961. Disbanded to M and WX, 1972.

H: Health, 1947, from old A-6, A-10 (Administration). Became Health Research, 1970. Spawned LS, 1979.

J: Weapons Testing, 1947, from M and Z. Later called Field Testing. Parts to CNC, 1971; L, 1972; G, 1977. Disbanded in 1979 to G, WX, P, and X although J-3 remains at Nevada under the Test and Verification Office.

K: Reactor Development, 1954, part from W. Part to P, 1956. Part from GMX, 1961. Disbanded 1970, partly to P.

L: Laser Research and Technology, 1972, part from J. Part to AP, 1976; part from T, 1976.

LS: Life Sciences, 1979, from H.

M: Experimental and Pit, 1945, from parts of X and G. Part to J, 1947; rest to GMX and W, 1948.

M: Dynamic Testing, 1972, from GMX. Got part of C, 1976.

MP: Medium Energy Physics, 1965, from P. Part to AT, 1978.

N: Nuclear Propulsion, 1955, part from W. Part to A, 1970 and 1972; parts to P, A, Q, E when disbanded in 1973.

O: Ordnance, 1944, from E. To Z and X in 1945.

OS: Operational Security/Safeguards, 1980, from security and nuclear materials offices.

P: Physics, 1945, from R and F. Parts to K, 1954; MP, 1965; E, 1972; Q, 1973; A, 1975; AT, 1978. Got parts of K, 1956; W, 1972; N, 1973; J and Q, 1979.

Q: Energy, 1973, from N and P. Got parts of R and T, 1977. Parts to CTR, 1974; R, 1976; G, 1977; S, 1978; P, 1979.

R: Research, 1944, from EP. Went to P, 1945.

R: Nuclear Safeguards, Reactor Safety and Technology, 1975, from A. To Q when disbanded, 1977.

S: Systems, Analysis and Assessment, 1978, from Q.

T: Theoretical Physics, 1943. Spawned F, 1944, absorbed F, 1945. Parts to C, 1968, and Q, 1977.

TD: Theoretical Design, 1971, from T and W. Got part of T, 1976. Parts to T, 1973; to X, 1979, when disbanded.

TR: Trinity. Task force for 1945 test near Alamogordo.

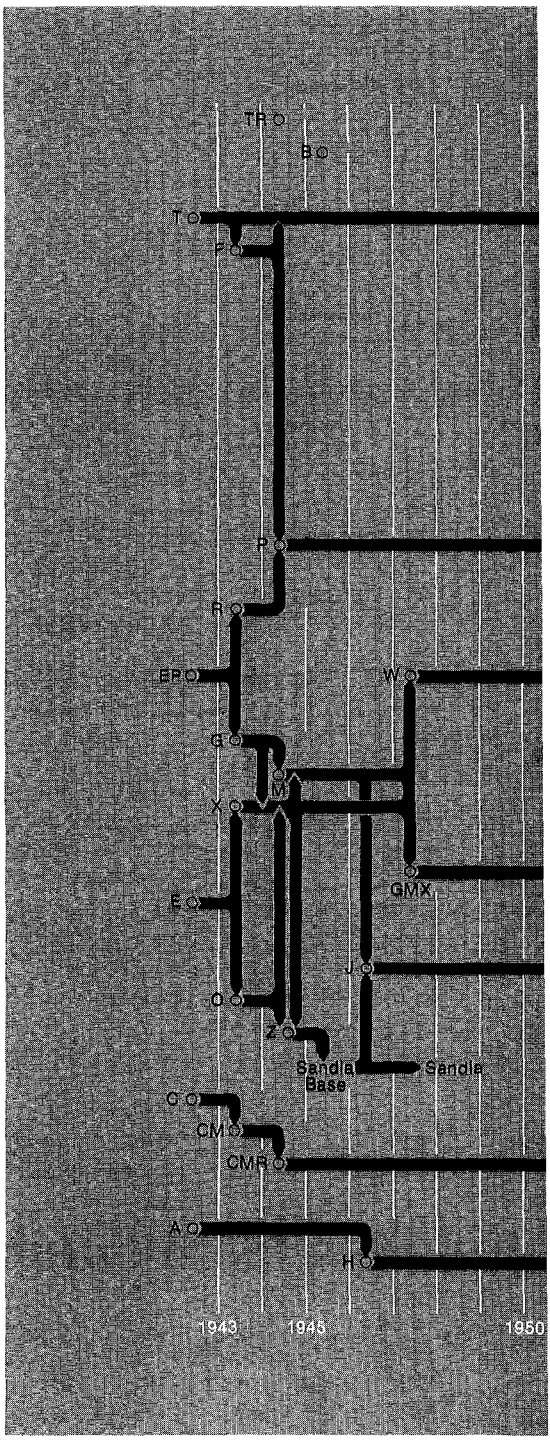
W: Weapons, 1948, from M and X. Parts to K, 1954, and N, 1955. Disbanded in 1972 to N, WX, P, A, TD and ADWP.

WX: Weapons Engineering, 1972, from GMX and W. Became Design Engineering, 1977. Absorbed parts of ENG, 1975; J, 1979.

X: Explosives, 1944, from E. Part from O, 1945. Parts to Z and M, 1945. Disbanded to GMX and W, 1948.

X: Theoretical Applications, 1979, from TD, T, L, J.

Z: Weapons Engineering and Stockpile, 1945, from X and O. Transferred to Sandia Base, 1946; part to J, 1947; made part of Sandia, 1948.



ROOTS

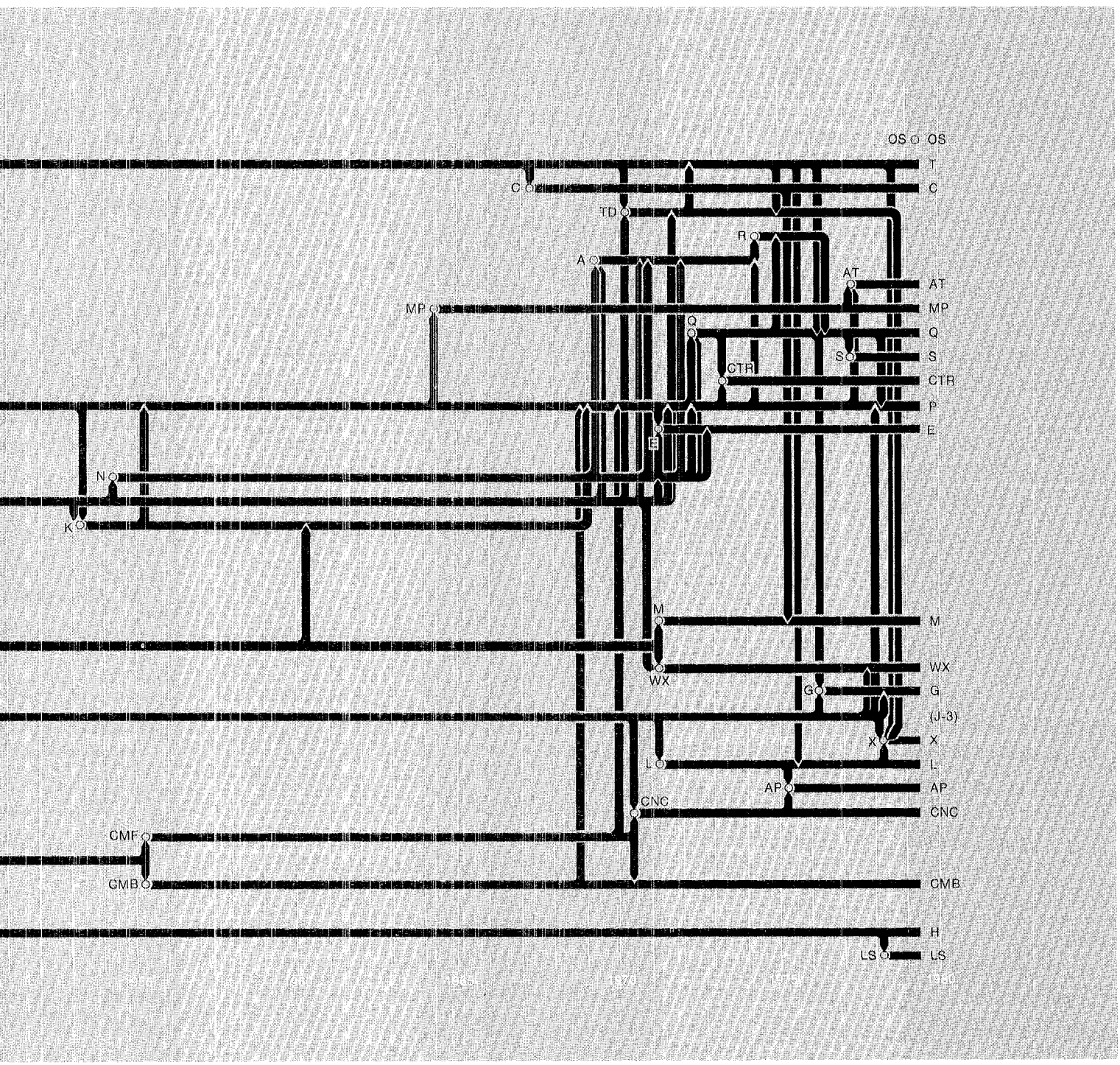


Illustration by Vicki Hartford

Directors' interviews

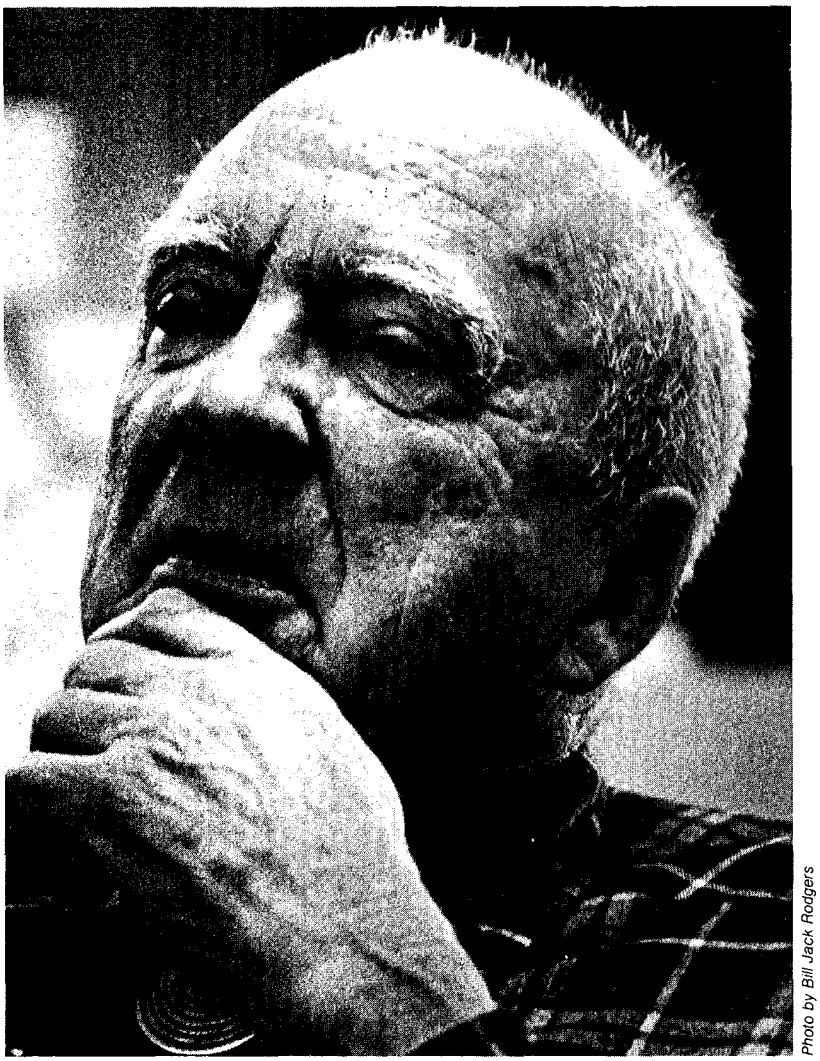


Photo by Bill Jack Rodgers

He was supposed to be Director for six months. It turned out to be 25 years. But as Norris Bradbury said: "You can't pretend to run an operation unless you are willing to stick with it yourself."

His tenure as LASL Director began 36 years ago. "One afternoon about 4 p.m.," Bradbury recalled, "Oppie called me into his office and asked, 'Would you be willing to be Director?' It was as simple as that.

"Well, this was something new. I had never thought at all about being Director. I don't know what went on behind the scenes, but it turned out that something very important had been overlooked; Oppenheimer and Groves forgot to consult the University of California. It caused quite an uproar in Berkeley, almost leading to the termination of the contract. However, I became Director, and the sin of omission was eventually forgiven."

Because it had fulfilled its original assignment—the speedy development of an atomic bomb—the Laboratory faced the possibility of being disbanded when Bradbury took over. The issue was settled with the passage of the Atomic Energy Act in 1946, and LASL's future was definite.

"Considering the background of nuclear development around the world," Bradbury said. "I, myself, never thought that the Laboratory would be closed down."

Inheriting a solid staff helped him through the transition years, which included times with no water, very little pavement, lots of mud, and not enough housing. He said the greatest thing Gen. Leslie R. Groves, Manhattan District head, did for the project was to build the Western (residential) Area.

"I told him that if we were going to continue we would have to have new and permanent-type housing, and we got it." Bradbury said.

He was careful to note what he called "the tremendous contribution" made by members of the Womens Army Corp (WAC), the Army's Special Engineer Detachment (SED), and the Military Police (MP). "They worked under tough situations," he said. "We had the world's worst vehicles in which the WACs made countless trips to Albuquerque; they never had an accident.

"There were many interruptions of careers," he added. "It was not uncommon to find some Ph.D., who had been drafted into the SEDs out cleaning latrines. They were a very remarkable group of people. The general harmony between the military and the civilians was amazingly good."

Asked what Laboratory accomplishment he was most proud of, he replied, "The hydrogen bomb—from the idea to final testing took an incredibly short amount of time. Everyone was eager or willing or both to work on it."

He said, though, that it was different during those times than in later years. Projects like the H-bomb had enormous support and could be completed in short amounts of time.

"We had very specific, tangible objectives and we were well supported in Washington," he said. "The Washington staff was quite well informed and you got what you needed—with one phone call. Later the AEC grew from what was a few hundred people to perhaps 10,000 and it became more difficult to know whom to call for what.

"There was a lot of pressure to get things done," Bradbury said, "but it's nice to have pressure."

—Vic Hogsett

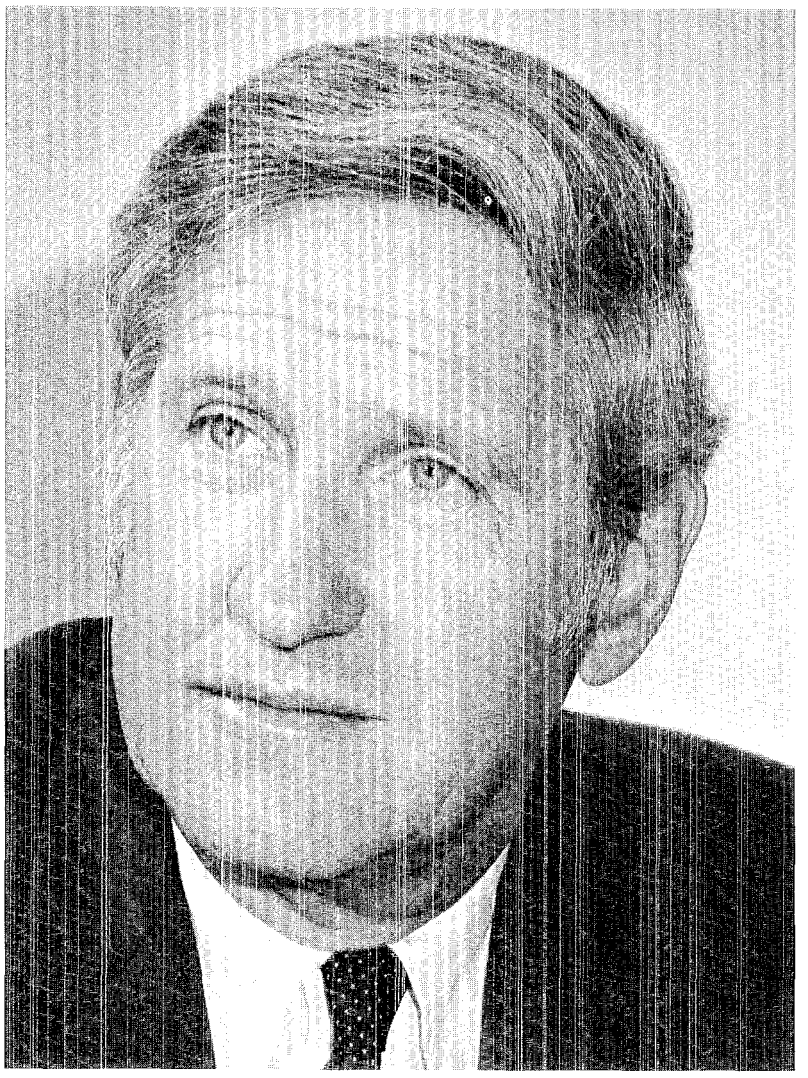


Photo file

"It looked like home. I was from Colorado, and I was delighted."

That's how Harold M. Agnew, LASL Director from 1970 to 1979, remembered his first view of Los Alamos in March 1943. Before, he'd been a student at the University of Denver where his physics professor, who knew eminent scientist Arthur H. Compton, arranged for Agnew to have a chance at working on the wartime Manhattan Project. And Agnew had been a member of the group led by Enrico Fermi that first sustained and controlled an atomic chain reaction December 2, 1942, at the University of Chicago's Stagg Field.

Fermi was to be one of the leading scientific mentors, from empirical and psychological viewpoints, at Los Alamos during the war. "Fermi was a great guy and I was lucky to work with him," Agnew said. "We also lived with the Fermis in Chicago when I went back to school after the war. I would say I liked to think of myself, in some regards, as his fair-haired boy."

Agnew flew with the 509th Bombardment Group as a scientific team member on the Hiroshima strike in August 1945, was scientific advisor to NATO in the 1960s, was the Weapons Division leader at Los Alamos, and a member of the General Advisory Committee to the Arms Control and Disarmament Agency. The greatest time of challenge in his career, he said, began around 1970, when he took over the helm at LASL.

"I was trying to take over from Norris Bradbury and fulfill what he had laid out for the Laboratory and what plans I had, and still not let the rest of the troops down... it certainly was a rewarding time. In terms of facilities, we got the study center, the plutonium facility on line with Bill Maraman's work, and the Antares laser construction going, to mention three.

"What pleased me the most, though, was having Los Alamos warheads on all the U.S. strategic delivery systems that make up part of our national defense. That's the way it has been, and that's the way it's going to stay."

Agnew, who is now president of General Atomics in San Diego, offered a comment about life in private industry: "People at the national labs don't know how lucky they are. The labs have technical muscle, really."

--Jeff Pederson

Photo file

Donald M. Kerr

Don Kerr, 41, became the Laboratory's fourth Director last summer, coming from the Department of Energy where he was Acting Assistant Secretary for Energy Technology. He had been Deputy Assistant Secretary at that post. He previously was Acting Assistant Secretary, then Deputy Assistant Secretary, for Defense Programs.

Before his 1976-1979 period in Washington, Kerr was with LASL for 10 years. He came onboard as a staff member in the High Altitude Phenomenology Group, went on to be group leader, was Assistant Test Division Leader, went on to be Assistant for Research in the Director's office, and in 1975 became the Alternate Energy Division Leader.

As the Laboratory begins the 35th year of the Atomic Age, we interviewed Director Don Kerr as to his policies, philosophies, and plans.

Atom: The laboratory has changed greatly since its single-mission role of 1943. How would you characterize that evolution?

Kerr: The Laboratory's mission has evolved considerably, but it has always been centered on the application of science and technology to national problems. Support of the nation's nuclear stockpile continues today. What has been added is a whole series of missions, starting with the magnetic fusion program known as Project Sherwood in the 1950s and diversifying further with the space nuclear propulsion program. Today, about half of our effort is in national security programs, roughly 40 per cent is in energy and basic research, and the remainder is work for federal agencies other than the Department of Energy.

Atom: Is Los Alamos being used to its best advantage as a tool to solve national problems, or is it being somewhat neglected as some have suggested?

Kerr: The Laboratory definitely has not been forgotten. Any activity that consumes as much of the taxpayer's money as ours cannot be put out of mind. Whether it is "leading" in certain technical areas is a variable from program to program. In the weapons program, the Laboratory's contribution has changed from inventing the first nuclear device to continuing support of the nation's nuclear deterrent posture. We no longer need to prove that weapons work, but to design them for particular applications, recognizing that the environment in which they are handled has changed substantially in 35 years. Concerns of safety, security, command and control—plus the costs of manufacture—dominate the weapons design effort.

Where we lead, one must point to new programs where we are exploiting an idea for the first time. We continue to try to perfect the hot, dry rock geothermal program, which was invented here. We lead in certain areas of inertial confinement fusion and in medium energy physics, the latter receiving about 25 per cent of the nation's nuclear science budget. Researchers who make use of the LAMPF accelerator receive another 25 per cent of that budget.

In the future, we hope to lead in several areas. One is in non-linear mathematics. Another is a recent project in the chemistry divisions which George Cowan calls "The 100 Atom Problem." How do you detect 100 atoms or molecules in the presence of 10^{26} others? This effort combines our growing, leading expertise in laser spectroscopy with our already developed radiochemistry capabilities to attack a problem with many future applications. We are planning to construct a proton storage ring as an adjunct to LAMPF to considerably enhance our research capabilities in condensed matter physics.

Atom: After three years with the DOE in Washington, your perspective as Director must be different from your predecessors'. How do your major reorganization changes, along the lines of matrix management, tie in with your views of the Laboratory's goals?

Kerr: Clearly, my view of the Laboratory was altered somewhat from working for the DOE and its predecessor, the Energy Research and Development Administration. In general, it was a favorable view. Los Alamos and its two sister weapons laboratories, Lawrence Livermore and Sandia, are the best of the DOE-administered labs, in my view. They have remained so because they have had a constancy of mission. They have also had the opportunity, over the last decade in particular, to grow in size and number of interests. That has kept them vital and challenged.

The problems I face differ substantially from my predecessors in terms of dealing with the federal government. J. Robert Oppenheimer, as the first Director, had no federal agency of the sort we now have to deal with. He had few, if any, resource limitations. When Norris Bradbury took over, the Atomic Energy Commission was being formed and there was a question whether there would be a Laboratory at all. LASL proceeded to develop concurrently with the parent agency (AEC), in a relationship considerably different from what you would find today in the DOE.

The AEC lasted some 28 years. It had a fairly narrow scope, in that it was devoted to the use of nuclear energy for civilian and

Photo by LeRoy N. Sanchez

military purposes. Rather late in its life, the broader scope of research and development in all energy technologies was permitted. This stimulated the Laboratory, as well as the agency, to diversify. With the transition to the ERDA during Harold Agnew's tenure, more politics entered. More diverse interests had to be served by the agency and more demands were placed on the Laboratory in terms of flexibility to deal with projects.

The DOE is a Cabinet-level department of the government, not an independent agency. It has much more political visibility, a much larger budget, and is much more focused on regulatory and economic concerns than either ERDA or the AEC was. The DOE still has the research and development responsibilities of the earlier agencies. But it has another tremendous responsibility that affects every American citizen: What is the price of energy going to be? This means the top management at DOE is not as attuned to research issues as the managers of the prior agencies were.

The reflection of these changes at the Laboratory is rather minimal. We're still fundamentally concerned with research and development. We do a bit more in terms of analytic support for headquarters than we used to, but the reorganizations at the Laboratory are really a matter of catching up to the changing nature of our research and development programs. These have evolved in number from one in 1943 to anywhere from 50 to 200 today, depending on how you aggregate programs.

The Laboratory's organization was never really changed during the first 36 years. It evolved from a form appropriate to the Manhattan Engineer District and few people had taken the time, or even had the opportunity to take the time, to see if there was another way to approach that problem. Harold Agnew had started to, but when he indicated he was resigning in 1978 he elected not to pursue reorganization studies he had initiated. He did share the results of those studies with me.

It was clear people were groping for an arrangement that would allow the Laboratory to apply its talents more flexibly within a multi-program framework. The approach we have taken has not been a radical departure in the major program areas. Nuclear weapons development activities are spread across the Laboratory, for the most part, and always have been. People have needed to integrate diverse activities between many of our divisions to accomplish that mission.

The difference is really occurring in some of the energy programs, which began as very small activities. As these programs have grown larger, they have caused a hybridization. Some divisions formed around a project, while other programs were multi-divisional. The approach I have taken is to try to rationalize that to some degree, so that single operating organizations are not subject to only one funding source or only one source of direction.

The trauma, for some people, occurs because responsibilities are altered. Some individuals gain security and stability from having continuity in responsibility and job title, so changes cause some worry. On the other hand, many people have found new and challenging opportunities in the organizational setup, and have recognized that we did not have a complete organization when I came onboard last year. Several senior people have retired in the last two years, and we had to replace them. To a degree, the organization had been tailored to fit the people who had to manage it. The present arrangement actually delegates more responsibility to a greater number of people than before.

It takes some time for people to accept responsibilities and understand how they are to work together. At the present, that is happening to an accelerating degree. There are still some significant things we need to do within some of the groups and divisions to reduce the overlaps in function and the number of duplicate facilities we have. We're compelled to do this for financial reasons. When inflation estimates of 8.5 per cent (in some cases) are used by DOE for budgeting, and real escalation runs as high as 15 to 20 per cent, we clearly need to find ways to keep inflation from making us compensate by decreases in staff and equipment.

Atom: Will there be any change in the forecast of very modest growth, perhaps two per cent yearly, for LASL?

Kerr: A fundamental constraint we have is the space available for offices and laboratory facilities. Right now, we are full. We have a new office building going up but it will not really permit any expansion. It will just move some people out of temporary and inadequate space. There are no plans to add major increments of working space at this time.

A Laboratory of some 7,450 people is large, and there is some question whether it would be any better should it grow beyond that figure. My view is to add new people if they are needed, but growth in itself is not an objective. Quality work is. Attention has to be focused on the staff we have, on how it can be upgraded over time, and on the real management problem: How to maintain a quality research staff without large growth. It is harder to add good people, and weed out those who are not so good, when you are in a static growth situation.

Atom: Does the Laboratory have any recruitment problems?

Kerr: In this period of anti-nuclear debate, uncertain defense policy, and conflicting arms control initiatives, it is more difficult to recruit top-quality people into the weapons program than it was in the past. That situation is compounded by the fact that the weapons program itself is relatively stable in numbers of personnel. We must continue to be able to think that the work we do is of the utmost national importance. When politicians take positions that appear to threaten that view, they pose a more difficult problem for the Laboratory.

Atom: What effects on the Laboratory would a Comprehensive Test Ban Treaty have?

Kerr: This would drastically change the way in which we conduct our activities in the weapons program. It would be a new problem in the 37-year history of the Laboratory. Fundamentally, it would mean that the requirement to support the nation's nuclear deterrent posture could not be met through testing to validate weapons designs. It would throw an increasing burden upon those people who would need to invent laboratory equivalent experiments, and to make theoretical calculations that might in small part substitute for full-scale underground nuclear testing.

My view at present is that the Comprehensive Test Ban Treaty that has been under negotiation serves neither our defense posture, nor rational arms control initiatives.

Atom: You have also said that one aspect of arms control should be deep and meaningful arms cuts among the major nuclear weapons powers.

Kerr: SALT II, of course, is a step in that direction on the Soviet side, in that it would require a reduction in the number of strategic delivery systems below those that the country now has. There are expectations that if SALT II were to go into effect, Salt III would then lead to arms reductions on both sides. That is a goal which I certainly support. It is a goal that the Laboratory would still need to support through credible work in weapons development and in maintaining surveillance of the nation's weapons stockpile.

As you reduce the numbers of arms, you of course attach greater importance to those weapons that remain. Consequently, their ability to support the deterrent posture should not be questioned.

Atom: Would you venture a prediction for the national nuclear energy policy's future over this decade?

Kerr: If the U.S. is to retain a strong,

industrialized economy, able to compete with western Europe and Japan in the marketplaces of the world, the use of nuclear energy is indispensable. The Laboratory has the opportunity to contribute greatly to making nuclear energy available. We are addressing today the three major impediments to further growth of that energy in this country: assured safety, effective safety, and acceptable waste disposal. We're the lead laboratory for the Nuclear Regulatory Commission's reactor safety calculations program. We have been involved with nuclear safeguards, which are the technical part of an effective non-proliferation policy. And we pursue fundamental research on nuclear waste management to understand radionuclide migration. While we are not known for being a nuclear reactor design laboratory, we are working on technical aspects of these three issues that have dominated nuclear debate over the last few years.

Should the U.S. not adopt nuclear energy in a growing role for our energy supply plans, I think we will have to face up to the fact that in so doing, we will make a decision to move away from the kind of economy and society we have grown accustomed to in the past 25 to 30 years.

Atom: Present management by the University of California, under contract, has become a "political football" in California, and to some extent in Congress. What are the chances of this 37-year-old arrangement changing?

Kerr: The answer is, "It all depends!" Clearly, it is dependent on the political mood of the nation, and more specifically, in California. At the present time, the Laboratory and the DOE have independently concluded that continuation of the University relationship is best for the nation, the DOE, and the Laboratory.

Should that posture change, we will look for an arrangement capable of maintaining a Laboratory able to do what's needed for the nation. Even some of those people in California who have questioned the relationship have not questioned the need for the Laboratory to be able to do its job. Both the DOE and the Laboratory have considered various alternative management schemes in their studies.

Atom: One occasionally hears an argument raised against the need for two competing weapons Laboratories. Could they ever be combined, or one dissolved?

Kerr: This is a difficult question to raise, because it leads you into discussing why there were two weapons Laboratories in the first place. But if you accept the premise that the institutionalized and rather carefully managed competition is of benefit to the nation and its weapons program, then that competition should have some value, as long as the U.S. is committed to nuclear weapons for its defense. The competition has been beneficial in the past and there is no reason why it should not be in the future.

Both Laboratories have diversified since they were founded, and it is important not to let the weapons program competition spill over into areas where it would be either inappropriate or unneeded. I think you will find at the present time very little of that. The only place we are supposed to compete with Livermore in an institutional way is in the weapons program. In other programs, we should compete with all the national labs where our capabilities overlap, then be very careful that our competitive instincts don't lead us into improper competition with universities on the one hand, or industry on the other.

Atom: Recently, you have pointed with some pride to LASL success with designs for the Minuteman III upgrading, the Trident missile, the Cruise missile, and the Pershing II. Overall, how are our weapons program capabilities?

Kerr: I think we are in a strong position. We are responsible for roughly two-thirds of the weapons in the nation's stockpile. We are responsible for all the new strategic systems now entering the stockpile. With the Pershing II and the B-61 programs, we are responsible for a good part of the tactical weapons as well. I think the Laboratory is well prepared to provide warhead alternatives for the future if needed by the Department of Defense. One of our major responsibilities is to remain so prepared.

Atom: Have you a list of personal goals or Laboratory projects that you want to see progress?

Kerr: On the scientific side, one initiative is to set up a branch of the Institute of Geophysics and Planetary Physics here in conjunction with the University of California. That would emphasize the earth sciences with the Laboratory, and would make it clear that there is an increasing need for research of this kind in both national security and energy programs. The IGPP branch will, I hope, cause a raised visibility in the academic community in a manner analogous to the hot, dry rock program raising the Laboratory's visibility in the industrial community.

A second area which I think may be very promising for the Laboratory over the next 20 years is increasing the breadth of our participation in the life sciences, particularly in biomedical areas. Our theoretical, computational, and modeling capabilities might be combined with new diagnostic techniques that are based on laser spectroscopy, radiochemical tagging, and recombinant DNA work. We could offer a combination of expertises here that wouldn't be equaled by virtually any other institution in the U.S.

I would like to see areas such as these two grow substantially. This is not to say that the traditional emphasis on physics and engineering at the Laboratory is improper, but there may be new opportunities in some of these fields that do not presently exist in, for example, nuclear physics. One way we will achieve these goals will be to follow our present plan to increase our basic research activities from 11 per cent of our total direct personnel to about 15 per cent within four or five years.

On the business side, one change I have made is to provide a central financial management office for the Laboratory. The hope is to support our people better in terms of managing their activities and reducing some of the administrative burdens that come with our multi-program responsibilities.

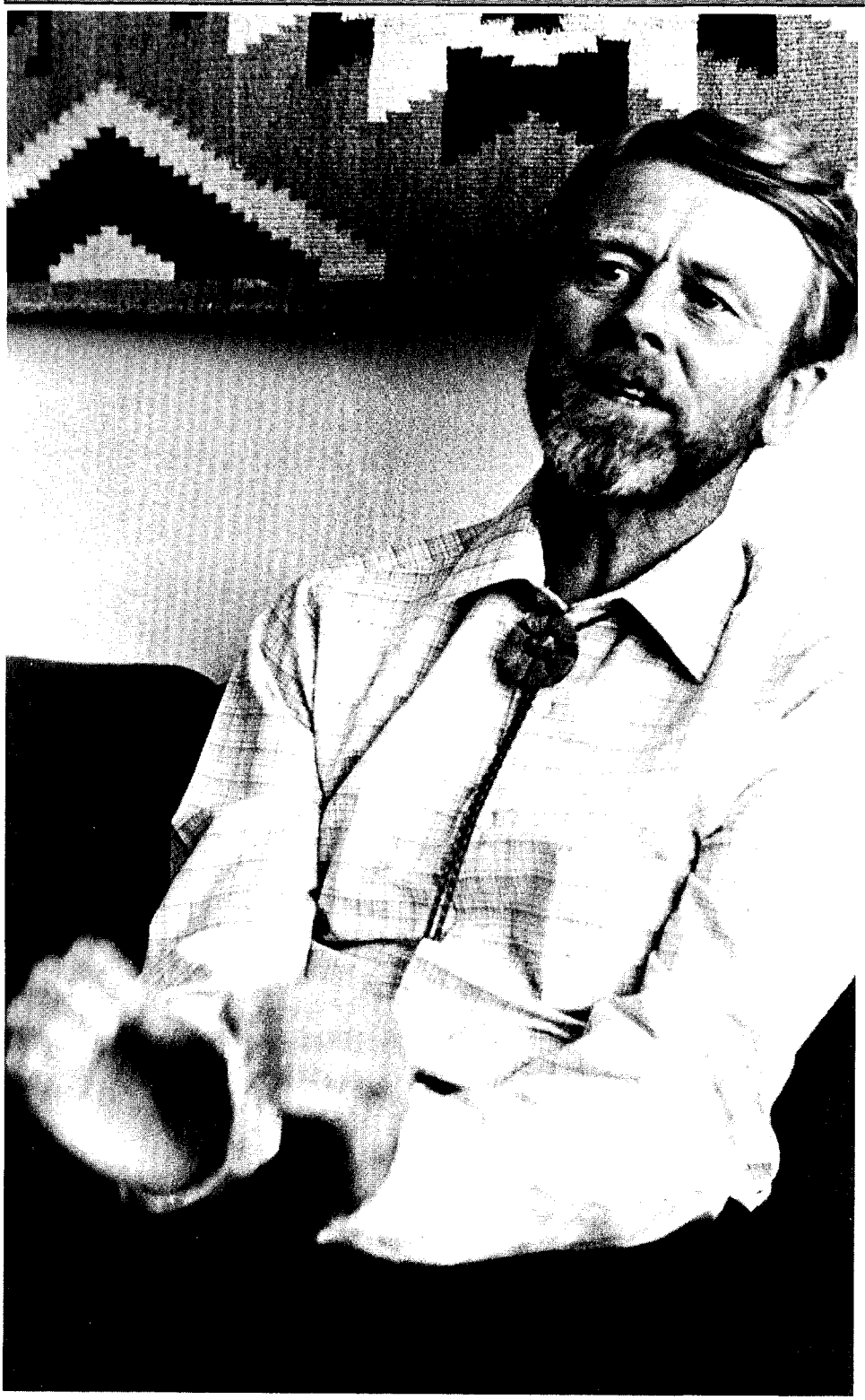
We are also trying to do things that might enhance the Laboratory's ability to deal with the outside world. In particular, we should pay more attention to the region we live in, the energy-rich Rocky Mountain states. There are many problems in terms of energy development, from studying the effects of boom town economics to technical questions concerning fossil fuels, where we might have a beneficial influence.

Atom: How would you characterize our relations with this region versus our relations with Washington, D.C.?

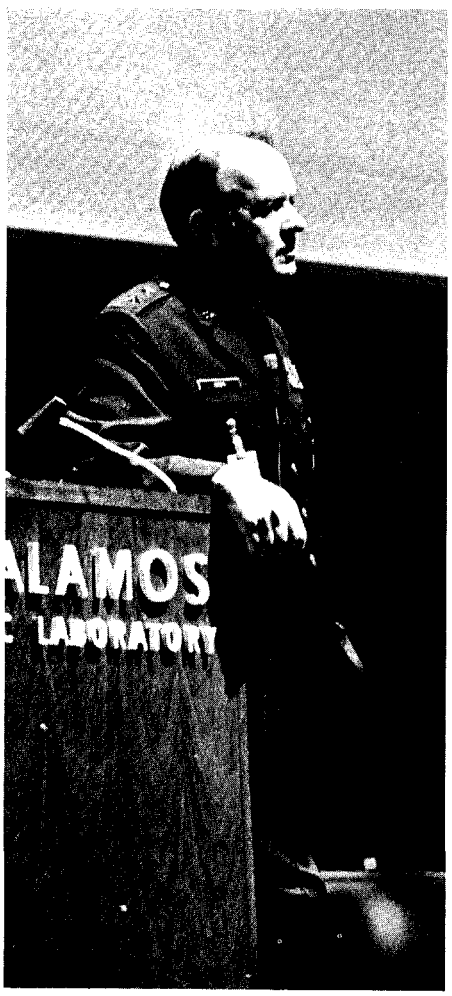
Kerr: As a national Laboratory, I think we are more visible in Washington at the present time. The authorization and appropriation processes governing our activities bring us to the attention of the federal government, both on the executive and legislative sides. Regionally, we have not been visible, with some exceptions, because we have not been perceived as carrying out activities of benefit to the Rocky Mountain West. Here, we are more seen as a national facility which happens to be located nearby. We are trying to develop some activities that take advantage of our presence here, and which will be perceived as being of regional value.

It is important that we do not do things that perhaps could be equally well done by some of the regional universities. Some of our work in the oil shale area may develop this character; some of our analysis and assessment capabilities will as well. If we become deeply involved in resource recovery activities, we may do things that are quite helpful to neighboring states and to New Mexico.

short takes



Among Our Visitors



Maj. Gen. C.S. Adams, Jr. spoke on SALT and the strategic nuclear balance at a special colloquium.

Photo by LeRoy N. Sanchez

Tom Gehrels discussed aspects of Saturn studied by the Pioneer satellite last Sept. 1 during a recent visit. He is an astronomy professor at the University of Arizona and a principal investigator for the Pioneer Saturn spacecraft.

Photo by John Flower

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Philip Morrison will be the speaker at this year's J. Robert Oppenheimer Memorial Lecture, July 14, 8 p.m. at the civic auditorium. Morrison's subject is "Lilliput, Brobdingnag and Los Alamos: Scale in Nature and Society." He is Institute Professor and Professor of Physics at Massachusetts Institute of Technology. A previous LASL employee, Morrison is also known for his commentaries on the NOVA television series.

About 227 kilograms of transuranic radioactive waste were incinerated in May during a test run of the Treatment Development Facility. The incinerator, a special model built from commercially available components, was effective in scrubbing (99.999 percent) and no radioactivity was found on the exhaust stack's air monitoring filters. The demonstration run began in late April and included a 24-hour heat up period, 24 hours of continuous burning, and a 24-hour cool down period. The facility reduces waste volume by about 40 to 1, converts radioactive elements to more chemically stable forms, and makes for a fairly homogeneous waste that can be processed into immobile forms such as ceramic clays for disposal. The facility was dedicated in 1976.

Allen J. Jennings has been named the Laboratory Controller. A former Air Force Colonel, he began duties here May 1. He previously was comptroller of the San Antonio Air Logistics Center at Kelly Air Force Base, Texas, directing the activities of more than 700 personnel. He received an M.A. in business administration from Webster College in 1979, his third academic degree.

John W. Hopson, an employee for 12 years, has been named head of the Dynamic Testing (M) Division effective June 1. He has been a member of that division during most of his tenure here, serving as Shock Wave Physics group leader and alternate division leader. He holds a Ph.D. in physics from the University of Texas at Austin. He assisted the Director for the establishment of the Los Alamos branch of the Institute of Geophysics and Planetary Physics, University of California.

Distinguished Performance Awards were given by Director Don Kerr to 24 employees in April ceremonies for their outstanding research contributions. They are: Samuel J. Barne, Ronald S. Dingus, Mitchell Feigenbaum, Gene Fox, Frank Harlow, Charles L. Mader, Joseph L. McKibben, Robert K. Osborne, Steve Rockwood, Edward C. Walterscheid, Donald L. Zichert, Edmond Cashwell, C.J. Everett, Jay R. Ackerhalt, Harold W. Galbraith, George Arnold, John Carlsten, Norman Kurnit, William Watson, Robert Wenzel, George Berzins, Nicholas King, Thomas O'Hare, Ronald Cosimi.

Tallied votes showed the Academic Senate of the University of California at Berkeley decided 786 to 526 in favor of continuing University ties with LASL and the Lawrence Livermore Laboratory. There were 1,896 possible voting members receiving mail ballots, which were tabulated in early April. Berkeley is one of nine UC system campuses. The University also manages Lawrence Berkeley Laboratory and the UCLA school of medicine under contract for a total yearly fee of $3.6 million. The present agreement covering LASL terminates Sept. 30, 1982.

Judith M. Liersch has been named the Assistant Director for Institutional Relations, replacing Frank DiLuzio who became Assistant to the Director. Liersch was formerly DiLuzio's deputy. Her office is responsible for LASL interfacing with state and local governments, the U.S. Congress, federal agencies, universities, and private industry. She has been with LASL since January, after two years as director of the Energy Extension Service, DOE, Washington, D.C.

LASL has been authorized to research solar production of synthetic fuels, according to the DOE. Technical activities will be from the Applied Photochemistry (AP) Division. Initial work for the program was carried out under funding from the DOE Office of Energy Research; work currently is for the DOE's Division of Central Solar Technology. The goal is to determine the feasibility of using concentrated sunlight to gasify coal to produce liquid and gaseous fuels. A carbon dioxide laser is being used to simulate the sun's rays. Products from the rapid heating of finely powdered coal are being investigated.

A new linear accelerator structure, termed the "missing link" in such technology, has been built and is being tested here. Initial tests on the radio-frequency quadrupole (RFQ) have been run. It represents a step forward because of its ability to both accelerate subatomic particles and to focus them into a coherent beam using a powerful electric field. The work is in the Accelerator Technology (AT) Division. The RFQ was developed for a project in Richland, Washington, where it will be part of the Fusion Materials Irradiation Test Facility—to test materials under neutron bombardment—at the Hanford Engineering Development Laboratory.

Jimmy F. McClary, a 15-year employee, has been named the head of the new Operational Security/ Safeguards (OS) Division. That unit was formed in January from the Security Office, the Nuclear Materials Department, and the Computer Protection Manager's Office. McClary holds a master's degree in physics from Texas A & M University.

John H. Birely has been named assistant director in the office of the Associate Director for Chemistry, Earth and Life Sciences. He has worked at LASL since 1974 in photochemistry and isotope separation. He received a Ph.D. in physical chemistry from Harvard.

patents

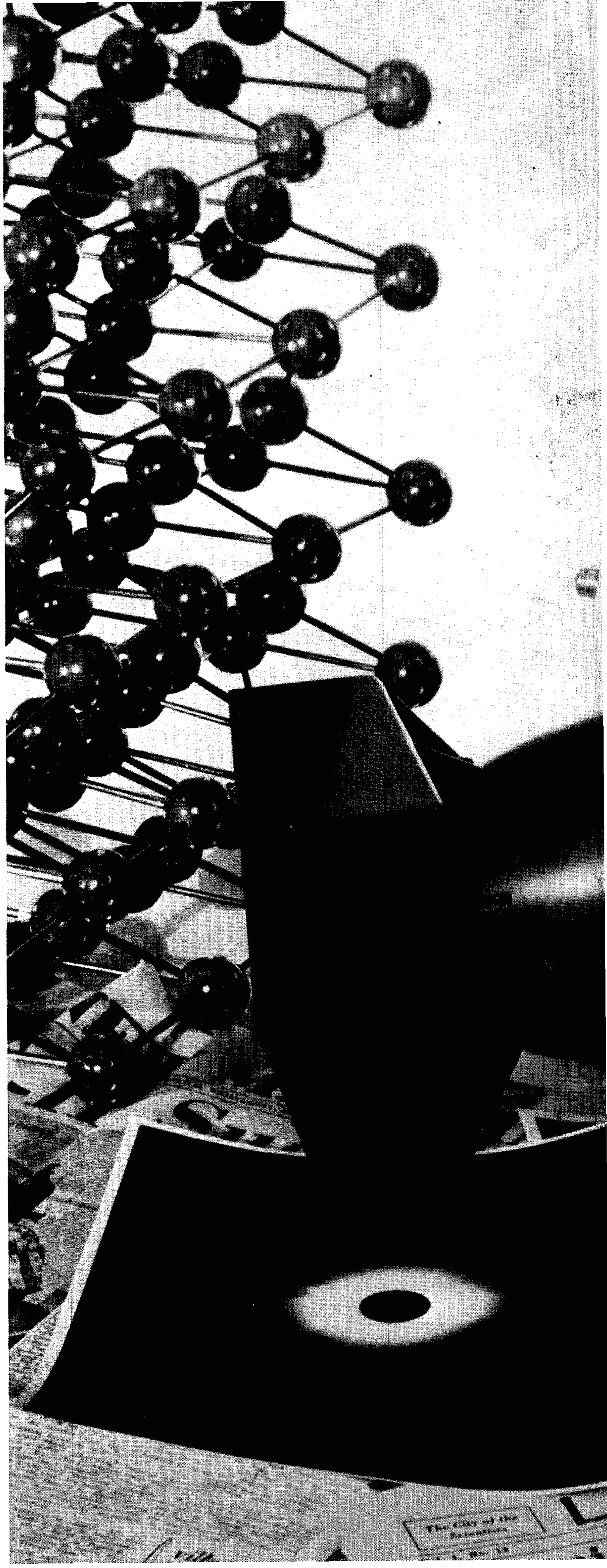
Patent 4,176,326 or "CF_4 Laser" was granted to Curt Wittig of Santa Monica, Calif., and Joe J. Tiee of group AP-4. The abstract states the laser uses a cryogenically cooled optically pumped cell containing molecular CF_4 gas. A resonant cavity induces oscillations.

Patent 4,180,428 or "Method for Making Hot-Pressed Fiber-Reinforced Carbide-Graphite Composite" was granted to Robert E. Riley of group CMB-6 and Terry C. Wallace, Sr. of group CMB-3. The abstract states several layers of a woven graphite cloth are pressed to produce a composite that has a uniformly dispersed, fine-grained tantalum carbide in graphite.

errata/addenda

We gave Thomas A. Sandford a new title on this page, last issue. Actually, he is the assistant to the Associate Director for Engineering Sciences.

LOS ALAMOS SCIENTIFIC LABORATORY



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